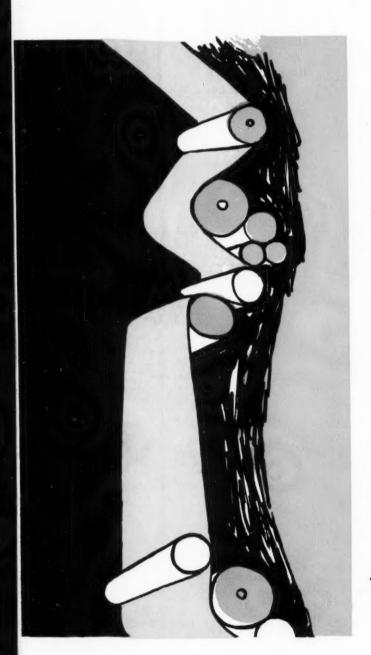
## Chemical

## Week



**APRIL 9. 1960** 

Price 50 cents

U.S. drafts commodity list for upcoming international tariffs meeting . p. 20

Seed oil research aims to fatten farms' raw-material role . . . . . . . . . p. 53

Ammonia process roundup. Trend is to mediumpressure plants . . . p. 65

The Seaway in '60. CPI shippers will continue to 'wait and see'...p. 76

Fluorescents glow in new inks. . p. 91



#### Puts the Anteater in the doghouse

If today's price of \$300 for a termite-devouring anteater tempts you, don't rush off to the zoo. You'll find Shell Chemical's dieldrin insecticide costs less and works better against timber-toppling termites.

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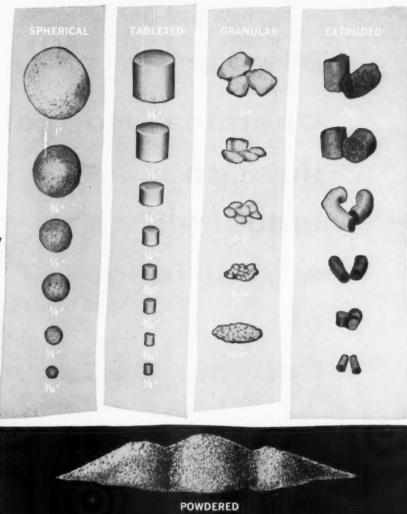
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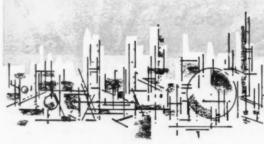
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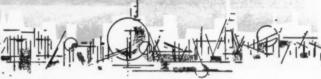
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#### TOP OF THE WEEK **APRIL 9. 1960** Universal Oil Products will broaden chemical interests. Story behind UOP's acquisition of Trubek Labs. .....p. 24 Chemical companies put more flexibility into retirement plans Pretty plant-pay for itself, or cost extra? Here's how production men evaluate the aesthetic plant layout ......p. 45 Domestic production of fluorspar at 20-year low. Reason: rising imports of this increasingly valuable mineral .....p. 84 7 VIEWPOINT duction men's views, pro and con, One way to help pay for funda-mental research: let private inon side aspect of plant design. 53 RESEARCH dustry get tax allowance for re-Search for new seed oils promises search expenses. payoff in new markets for farm 7 LETTERS products. 7 MEETINGS 65 ENGINEERING 17 BUSINESS NEWSLETTER Ammonia process trends pinpointed in SRI's nationwide plant-by-20 Chemical management sees new plant study of NH3 capacity. threat to domestic industry in upcoming GATT conference. 71 TECHNOLOGY NEWSLETTER 21 South African race riots-do they reflect overseas situation that could 76 SALES AND DISTRIBUTION affect U.S. investments? CPI shippers remain reluctant to use St. Lawrence Seaway, despite 22 '59's financing—how companies predictions of improved service. adjusted budgets to biggest-yet sales, rising costs. 78 Fertilizer makers see another record-breaking year. But there 24 Look for UOP to gain stature as chemicals maker, assisted by newly are likely sales trouble-spots. added Trubek Labs. 81 MARKET NEWSLETTER 25 Engelhard Industries bares operat-84 MARKETS ing data for stock offering; teams Domestic producers of fluorspar with Mallinckrodt and Montecagloomy as imports kill their tini on nuclear materials venture. markets. Outlook: little relief. 27 WASHINGTON NEWSLETTER 91 SPECIALTIES 33 ADMINISTRATION New face in the detergents field: Advancing age of employees forces Standard International buys Lestoil management to add flexibility to

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Plant beautification: here are pro-

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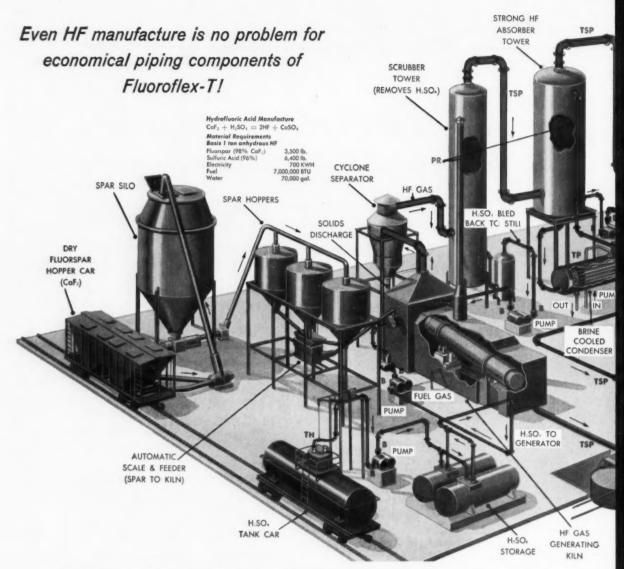
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92 Bright future for fluorescent pig-

ments, as new inks win major

packaging and newspaper printing

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## NOW AT LAST, for all your corrosive of long-life, corrosion-

Now it is possible for you to pipe your entire corrosive process from start to finish in corrosion-impervious Fluoroflex®-T, to save you money in faster installation, and decreased maintenance, process downtime, replacements, and production headaches!

Fluoroflex-T, the proprietary Teffon® product manufactured and fabricated solely by Resistoflex, combines two important elements:

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2. Optimum flexibility, density, strength, and flex-life; nonporosity and structural uniformity; all imparted by Resistoflex's superior fabrication techniques.

As to the kind of economies possible, one plant equipped with Fluoroflex-T reported savings of \$60,000 per month in costs of maintenance, downtime, and product loss!

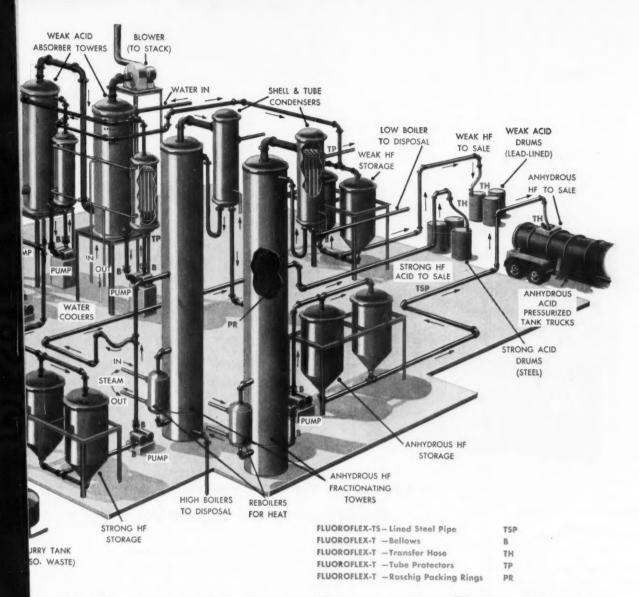
This in addition to installation economies. The Fluoroflex-T

family of corrosion-resistant piping components (see panel at side) have all been designed for complete couplability and hookup ease, in a complete range of sizes to fit any flow, process, or process path.

If you have problems of handling corrosive fluids—in cost, equipment maintenance and replacement, process downtime—why not talk them over with Resistoflex? As they have for others, their fully experienced staff of engineers and equipment specialists may be able to save you money, time, and headaches! Write for Bulletin today!

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Fluoroflex-T Lined Steel Pipe: Prefabricated to section lengths, conforming to your blueprint specs, with flanges on and ready to assemble. Minimizes assembly time; shortens checkout time; suitable for all fluids; complete series of fittings and connections available.



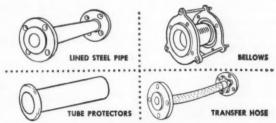
### piping problems, the overall economy proof FLUOROFLEX-T (TEFLON)!

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Dip Pipes, Spargers, Thermowells: For non-corrosive nozzle openings, steam nozzles, instrument wells in process equipment. Condenser Tube Protectors: Eliminate erosion and corrosion of high-velocity acid in entry side of condenser tubes. And also:

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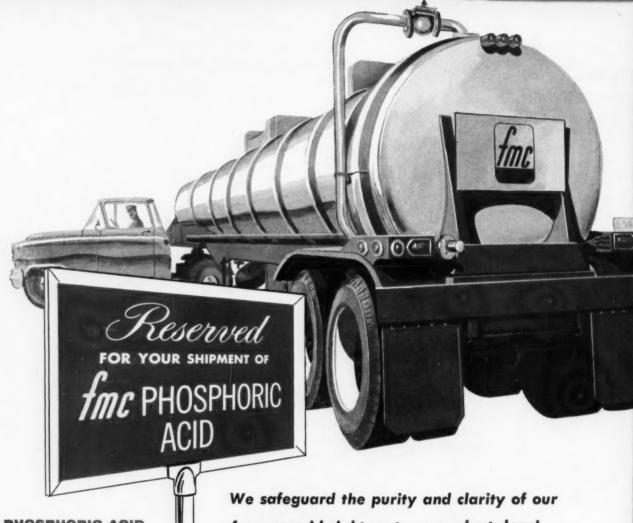


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Whatever your use for phosphoric acid ... in foods, phosphatizing, brightdipping, soil stabilization or fertilizers...we can supply the grade and form you need. We'll be glad to quote on phosphoric acid alone or in combination with phosphates.

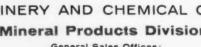


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#### U. S. Craftsmanship

To the Editor: I read with great interest your article "Colorful Buildings Create Chemical Markets" (Jan. 30). This story was pegged on the glass used in the recently completed American Airlines building. . . .

An otherwise good article was spoiled by one very misleading statement. This was, in referring to the building, "the glass for which was made in Germany." This statement is true as far as it goes—the glass was made in Germany. However, it leads the reader to believe the window itself was made in Germany. This is not true.

The window was designed by Robert Sowers, one of the great young American designers, and the job was executed in the studios of the Rambusch Decorating Co., 40 West 13th St., New York, N.Y.

It is a mistaken belief on the part of many people that stained glass is a lost art and that any work which is done in the craft has to come from Europe.

Quite to the contrary, American studios are turning out the best stained-glass work done in the world today. Working under most unfavorable competitive conditions — wages paid European stained-glass craftsmen are 65-80% under those paid in the U. S. —we must constantly battle to overcome the European myth.

J. G. LLOYD Stained Glass Assn. of America Pittsburgh

#### MEETINGS

Synthetic Organic Chemical Manufacturers Assn., meeting, Roosvelt Hotel, New York, April 12.

American Institute of Mining, Metallurgy & Petroleum Engineers, Southwest metals and minerals conference, Ambassador Hotel, Los Angeles, April 21-22.

American Ceramic Society, annual meeting, Bellevue Stratford Hotel, Philadelphia, April 24-28.

Society of Plastics Engineers; conference theme: "Plastics in Petroleum and Petrochemical Industries," Dallas, Tex., April 28.

Second European Symposium on Chemical Reaction Engineering, Amsterdam, Holland, April 28-30.

Parenteral Drug Assn., Warwick Hotel, Philadelphia, April 29.

#### VIEWPOINT

#### A Way to Pay for Basic Research

THOUGHTFUL EXECUTIVES AGREE that we need more basic research—the pursuit of new knowledge solely for knowledge's sake—but we're still not getting enough of it. What's holding things up? The question of who'll pay for it.

Strong arguments can be marshaled against letting the government support more basic research. The \$494 million it will spend this year is almost half the total national basic research budget. A larger government share would entail a greater risk of too much centralized control of programs at universities and other research centers. And budget cuts, whatever the reason, could arbitrarily scuttle such programs.

A neat case for encouraging industry to share the load through tax incentives was made by Westinghouse President Mark W. Cresap, Jr., in a recent talk before the Economic Club of Detroit:

"There is little point in simply exhorting industry to increase its expenditures and grants in support of basic science.

"Basic science is not industry's first responsibility; and it will do no more of it in its own laboratories than it can justify economically. It will contract research projects to outside laboratories only when it is advantageous to do so. It will give as much money as it feels it can afford to the universities for pure research work and for better research facilities. Perhaps we should all give more money than we do; but to say this in the pious hope that something will be done is like shouting against the wind.

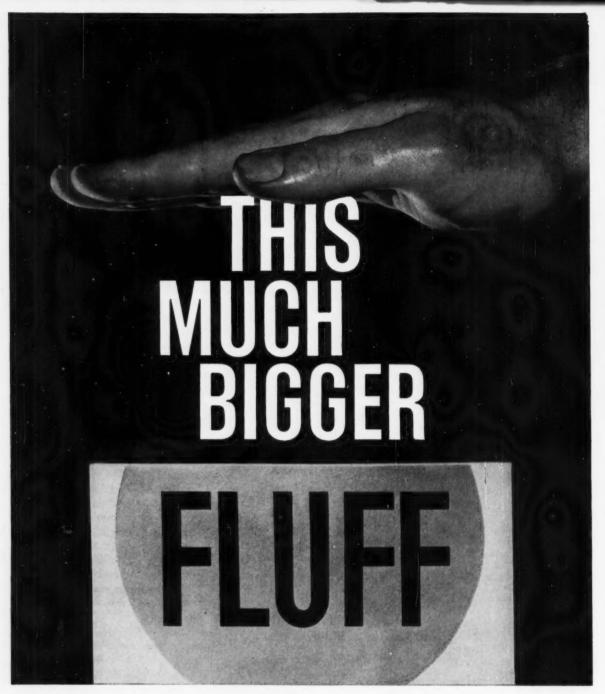
"The answer is that the federal government must give industry a reason—an incentive—to increase progressively its support of basic research."

Pointing out that the National Science Foundation has recommended consideration of tax incentives for this purpose, and that the idea has picked up momentum in various other government and scientific quarters, Cresap specifically endorses the Curtis bill (H.R. 4797) now before the 86th Congress.

This bill permits deduction from a firm's or individual's income tax of 90% of contributions to colleges and other nonprofits for basic scientific research; not more than 5% of the total tax could be deducted. Businesses doing their own basic research could deduct 75% of the cost, this amount not to exceed 3% of the total tax.

"This method of research support is more desirable, more effective and less expensive than direct grants by government," Cresap believes. "For one thing, the money would go straight from the taxpayer to the laboratory. It would not make that long trip from industry to Washington and then on to the laboratory; and thus it would escape the attrition and administrative expense that result on that journey. For another thing, interference with and control of university research work would be minimized, because the grants would have no strings attached and would come from many sources. Stability of research operations would be improved, because they would be less subject to annual political review and change. Most important, of course, the proportion of work carried on in pure science would rise rather quickly and substantially. More of the talent in industrial laboratories would be directed at basic research."

All industry, including the CPI, similarly faces U.S.S.R.'s research challenge, which Cresap describes as "a race of unknown length over a strange track," its only known element being "the fatal consequence we face if we come in second."



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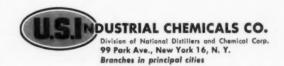
The new brochure contains the latest information on metallic sodium and its applications, sodium-handling equipment, methods of handling sodium in the plant and general safety and first aid procedures. A comprehensive list of references has also been up-dated.

New information has swelled the equipment section to more than double its previous size. There are many clear, easy-to-follow illustrations and diagrams plus much more detail on such aspects of sodium handling as construction of pipelines; heating lines and valves; insulation, repair and alteration of lines; recommended gaskets, valves and vessels; pumping, transferring, filtering and

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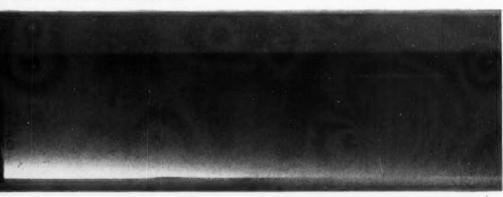
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11

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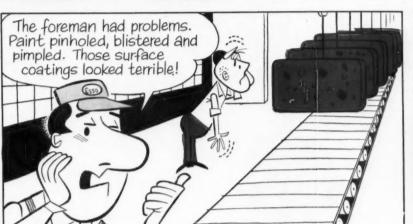
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SOLVESSO

Sounds great, he said. (He was also glad to learn that Esso is a pioneer in better odor solvents — and that Esso has a staff of experts in its refineries dedicated to the continuing improvement of solvents.)





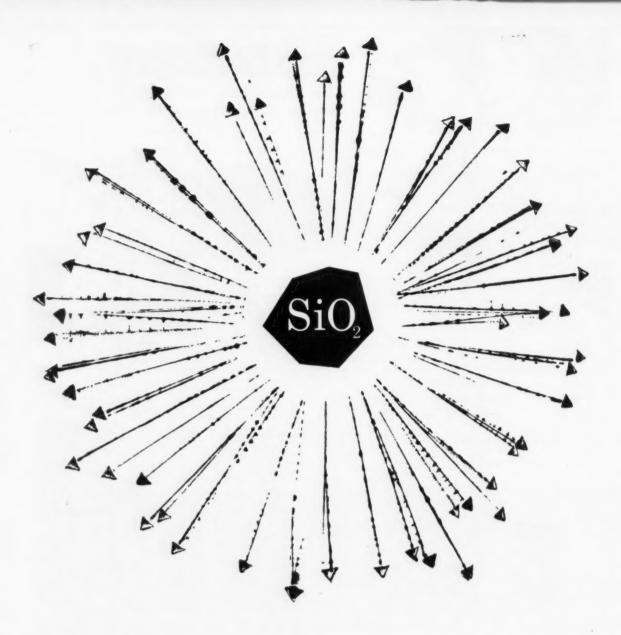


PETROLEUM SOLVENTS

#### ESSO STANDARD,

Division of Humble Oil & Refining Company, 15 West 51st Street, New York 19, New York

In Industry after Industry..."ESSO RESEARCH works wonders with oil"



#### Davison Silica Gel-one of Industry's most versatile chemicals

Silica Gel is a form of silicon dioxide with a porous structure that can adsorb 40% of its weight of water from saturated air. The internal pore surface area of 1 cu. in. of silica gel is calculated to equal 90,000 sq. ft. Its adsorption property is purely physical . . . pore size and shape remain constant on saturation.

This large surface area characteristic is the basis for a number of industrial applications for silica gel. Because surface area, pore size and density can be carefully controlled during production, silica gel has found profitable use in such widely divergent fields as paint, oil and gas, chemical, paper and pharmaceutical. If you have a problem in gas or liquid drying, flatting, antiblocking, thickening, moisture removal, dehydrated packaging, or catalyst support, write Dept. 3504 for technical assistance and information.

DEPARTMENT 3504

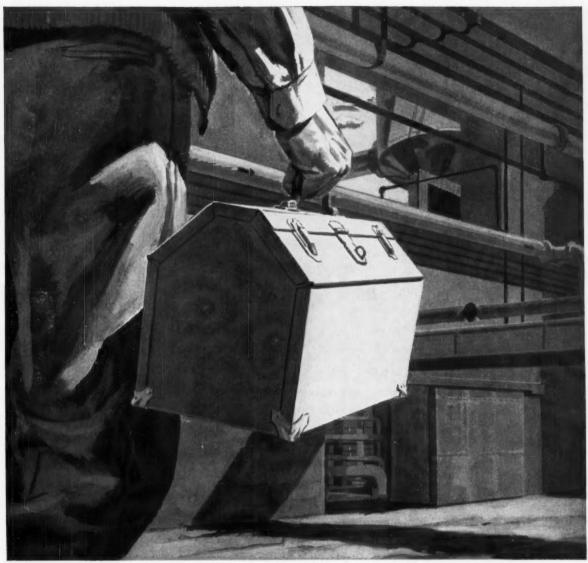
W.R.GRACE & CO. DAVISON CHEMICAL DIVISION

BALTIMORE 3, MARYLAND



#### **ALLIS-CHALMERS**





This maintenance man's toolbox sums up the story of

### the simplest process in processing:

#### maintaining the products of Allis-Chalmers

Even the standard products Allis-Chalmers builds for chemical processing are designed for the industry's special requirements . . . and designed so routine inspection and maintenance are simply, quickly done.

And from no other manufacturer can you match the range of equipment available and benefit from Allis-Chalmers unit responsibility. Listed at right are some of the Allis-Chalmers products built to serve you economically throughout the plant — from raw material to finished product.

For service that matches the quality of the equipment, call the A-C representative near you. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-C products for chemicals: Electrical Generation and Distribution Equipment; Pumps, Motors, Control, Valves, Dielectric Heaters, Rectifiers; Processing Machinery (mills, screens, kilns); Water Conditioning Systems, plus Material Handling Equipment.

A-1268

#### NEW NON-IONIC SURFACTANT

Makon 10 is a nonyl phenoxy polyoxyethylene ethanol offering excellent detergency, foaming, dispersing, emulsifying and solubilizing action. It will not hydrolyze in aqueous solutions of alkalis or acids. It can be used with anionic, cationic or other non-ionic agents. Makon 10 is effective in hard or soft water, as it does not form salts with metallic ions and is also unaffected by oxidizing or reducing agents.

## EPAN makon 10

#### **SPECIFICATIONS**

**Physical State:** Clear viscous liquid Pale yellow to colorless

Color: Cloud Point of 1%

Solution in Water:

pH (1% solution): Solidification Point

Flash Point (°C): Fire Point (°C):

8.85 lbs. per gallon Density:

Specific Gravity (25°C): 1.06

Send Coupon for Further Information and Sample

0

427 W. Randolph Street, Chicago 6, Illinois Telephone: STate 2-4711

America's Most Complete Line of Surfactants - Make Stepan your "SHQ" (surfactant headquarters)

|                | n Chemical Comp<br>V. Randolph Stre                                |      | Illinois | CW-4A |
|----------------|--|------|----------|-------|
| G <sub>4</sub> | ontlemen: Please send<br>Sample of Makon 1<br>Technical Bulletin o | d me |          |       |
| Fire           | n  |      |          |       |
| Str            | eet Address  |      |          |       |
| Cir            |  | Zone | State    |       |

52°-56°C

Neutral

290°

330°

#### **Business**

#### Newsletter

CHEMICAL WEEK April 9, 1960 Witco is planning a second phthalic plant. This company, which just last year started up at Chicago a 20-million-lbs./year phthalic anhydride facility, now says it will build a 30-million-lbs./year plant "somewhere in the East." The Eastern plant, which will use the naphthalene oxidation process, will broaden Witco's service to Eastern customers with expanding markets in polyesters, plasticizers and paint fields. Completion date is set for last-quarter '61.

Reflecting worldwide increase in demand for chemicals last year, Imperial Chemical Industries Ltd. (London) reports its total sales at home and abroad rose 10% over the previous year, to a record \$1,425.2 million from the previous year's \$1,296.4 million.

Exports are said to have increased even more impressively—by more than 18%—to \$245 million from \$206.6. Also reported: sharp increases in ICI group profits for '59, to a new peak of \$204.7 million before taxes, compared with the '58 total of \$124.6.

#### And U.S. companies continue to expand facilities abroad:

- Hercules Powder has a brand-new, wholly owned subsidiary in Sweden—Hercules Kemiska Aktiebolog (Gothenburg). Managing director of the new firm: Prosper F. Neumann, formerly Hercules' manager of rosin size sales for papermakers. The new plant is slated to produce a complete line of chemicals for the Swedish paper industry, initially will make rosin size.
- Dow Chimica Italiana (Milan) is selecting a site for the planned chemical products, plastics, fibers and metal complex to be constructed in that country. Initial capitalization: \$192,000 subscribed by Swiss Dow Chemie AG.
- Nopco Chemical's subsidiary, Nopco Chimie S.A. (Fribourg, Switzerland), has acquired a one-half interest in the French chemical firm, Doittau-Sopura, S.A. (Corbeil-Essonnes) near Paris. Involved in the transaction: \$300,000, according to E. A. Robinson, vice-president in charge of Nopco's newly formed International Division.

The \$639-million Peace River, B.C., development project is one step further ahead this week. The Canadian government has authorized Peace River Power Development Co. to apply to public utilities commission for a required certificate and license. But first the company must have signed contracts with its major customers, British Columbia Electric and British Columbia Power Commission, for purchase of power. Price negotiations are under way.

#### **Business**

#### Newsletter

(Continued)

The business outlook is still good. Early indications of first-quarter results: Hercules Powder expects an 11% rise in sales and a 9% gain in earnings, compared with last year's first period; and Reichhold Chemicals says its February sales were up 28%, to \$8.04 million.

In '59 profits, most branches of the CPI did better than the all-manufacturing average—which was a 29% increase over '58 net income. Among the process industries, the highest increase—a 47.4% rise, to \$541 million—was scored by producers of primary nonferrous metals, the group that suffered the most during the 1957-58 recession.

Other process industries' '59 profit performances, as computed this week by the Securities & Exchange Commission and Federal Trade Commission: basic chemicals, up 38.6%, to \$1,159 million; products of stone, clay and glass, up 33.3%, to \$685 million; rubber and plastics products, up 31.9%, to \$347 million; paper and allied products, up 22.3%, to \$619 million; pharmaceuticals, up 11.4%, to \$382 million; and petroleum refining, up 6.4%, to \$2,625 million.

But the federal government directly affects CPI profits, as well as computes them. Vitro Corp. this week is explaining to stockholders how three government moves bit into earnings to the extent of \$812,663. Termination of the Atomic Energy Commission's thorium procurement program and substantial cutbacks in the titanium and aviation programs forced three plant shutdowns, largely caused a \$911,411 net loss for '59.

A farm chemical was the object of a power play in Washington late last week. Opponents of the use of maleic hydrazide (MH-30) on tobacco plants arranged two conferences in Washington—reportedly to have treated tobacco reclassified on the price support schedule, which would have the effect of substantially cutting its market price.

But when word of this alleged objective got out to the North Carolina farmers, they sent telegrams and representatives to Washington to counter the move. In the two conferences, the anti-MH-30 delegation did not propose the price support switch; instead, this group advocated a requirement that all nontreated tobacco be so labeled when it's offered for sale to tobacco companies. This suggestion got nowhere. Rep. Harold Cooley, chairman of the House Agriculture Committee, questioned its legality, observing: "I'm afraid if we started that, we might soon be identifying tobacco not grown with a certain kind of fertilizer."

A propylene oxide and derivatives plant will be built at Priolo, Sicily, by Union Carbide and Societa Edison (Milan, Italy). The 25-million-lbs./year plant will be operated by S.p.A. Celene, a company formed three years ago by Union Carbide and Societa Edison. Celene's polyethylene plant is being expanded to 65 million lbs./year, and a 70-million-lbs./year solvents plant is being built.

## AGGREGATE LIQUID CURING AGENT



FOR
PROBLEM
AREAS



BORDEN CHEMICAL IT'S GOT TO BE GOOD It's RESILITH—the heavy-duty floor resurfacer that can be installed and placed in use in 12 hours or less! *It works where others won't.* And it resists alkalies, acids, solvents, abrasion and impact.\*

Borden Chemical's Development Laboratory at Peabody, Mass., developed it. But the main point is that the research done at Peabody is just one example of Borden's work in thermosetting and thermoplastic resins. All told, coast to coast, Borden Chemical has seven such labs with the capability to solve an infinite variety of resin and polymer problems. Including yours! Write Borden Chemical Co., 350 Madison Ave., New York 17, N.Y.

\*Write for the name of a Resilith Flooring Contractor near you.

## Chemical Week

APR. 1960 S M I W I F S 3 4 5 6 7 8 9 10 11 12 13 14 15 16 10 17 18 19 20 21 22 23 17 18 19 20 21 22 23 24 25 26 27 28 29 30

MAY 1960 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

JUNE 1960
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19 20 21 22 23 24 25
26 27 28 29 30

AUG. 1960 S M T W T F S T 8 9 10 11 12 13 21 22 23 24 25 26 27 28 29 30 31

 Initial list of commodities being drawn up

Last chance to request that particular products be included or excluded

Initial list to be published

Public "peril-point" hearings by U.S. Tariff Commission

Chance to argue that tariff rates on specific commodities not be negotiated below certain minimum levels

Final revision by President's Trade Policy Committee

Final list to be announced

GATT tariff negotiations at Geneva, Switzerland

First phase: negotiations incident to formation of European "Common Market" and "Outer Seven" bloc.

Second phase: exchange of new concessions among contracting parties and new member nations.

#### Mobilizing to

U.S. chemical industry leaders are always apprehensive about upcoming international tariff meetings. But a sounding this week indicates they are much more concerned about the conference scheduled for this fall than they've been over any similar meeting in the past four years.

Big reason for their increased anxiety: this year's trade winds seem to be blowing strong for tariff-cutting.

A number of factors are behind the Eisenhower Administration's present free-trade stand. One that appears to carry considerable weight among government officials is the argument that if the Administration's drive for a big boost in total U.S. exports is to make any headway, the U.S. will have to trim tariff rates at home in exchange for similar concessions by this country's trading partners. In turn, the drive to boost exports is motivated by concern about this nation's continuing outflow of gold and its declining "balance of trade."

Another current force behind the free-trade tendency: this country's international relations-meaning the desirability of promoting unity instead of strife among this country's principal allies. This factor is always present, of course; but it has special urgency right now because of the growing friction between the two big trading blocs in Europe-the six-nation European Economic Community (EEC), popularly called the European "Common Market"; and the European Free Trade Assn. (EFTA) of the "Outer Seven" nations. The U.S. has been trying to mediate between these two groups, and one tactic under consideration is for the U.S. and the European countries to harmonize all their trading policies through the General Agreement on Tariffs and Trade (GATT).

These pressures are acting on the U.S. government's current preparations for the big GATT conference to begin this September in Geneva, Switzerland. Chemical industry leaders feel that the government will propose tariff reductions on a sweeping list of commodities—including many

#### **Block Chemical Tariff Cuts**

chemical products that could be imported into the U.S. in large quantities.

First move on behalf of the chemical industry came last fall at the very outset of the government's preparations for the 1960-61 GATT meeting. Both the Manufacturing Chemists' Assn. and the Synthetic Organic Chemical Manufacturers Assn. acted swiftly to get the government's tradeand-tariff specialists to use individual product names-rather than "basket" designations covering numerous chemicals - in compiling their list of commodities to be discussed at Geneva. MCA President John Hull told the Committee for Reciprocity Information that use of basket listings - such as "fatty alcohols and fatty acids, sulfated, and salts of sulfated fatty acids" - does not adequately inform domestic producers of the specific products that may be involved in the GATT negotiations.

And last month, SOCMA President Samuel Baker proposed further industry action. Warning that the government's list may include hundreds of synthetic organics, Baker called on each SOCMA member company to name a qualified representative to argue for exclusion of its products.

With the government's specialists now planning to reveal their preliminary list about May 1, SOCMA's efforts this month will be aimed at having key products deleted before the list is published. Where this approach is not successful, it's planned to present oral and written protests concerning those products at public hearings to be held later by the U. S. Tariff Commission.

These so-called "peril-point" hearings will help determine the secret tariff rate levels that U.S. negotiators will not be allowed to undercut in GATT bargaining. And if industry representatives can demonstrate that present import duties are at rock bottom, the products concerned will be dropped from the list.

The situation is complicated by the fact that various U.S. companies and trade associations have been arguing

for and against new tariff concessions on various CPI products. Domestic producers, consumers, and importexport traders have all been speaking up for their respective — and sometimes conflicting — interests.

Among the companies and groups that have been heard from so far:

- Freeport Nickel Co. is asking that the duty on prime metallic nickel be kept at 1.25¢/lb.; but International Nickel Co. and Crucible Steel Co. are asking that the rate be lowered.
- Hostachem Corp. U.S. affiliate of West Germany's Farbwerke
   Hoechst is asking for lower tariffs on a long list of basic chemicals.
- Eastman Chemical Products wants concessions on plastics shipments to France; and various producers want concessions on exports of plastic, asbestos and ceramic tiles.
- Adhesive Manufacturers Assn. of America wants to be informed of any intention to reduce tariffs on adhesives.
- Numerous producers and trade groups want the U.S. negotiators to seek broad concessions on exports of pulp and paper to Europe and Japan.

#### Frontier Trouble

Long-range planning for chemical development in the world's "frontier" areas—Africa, Asia and Latin America—is marking time this week as management in the U.S. uneasily surveys tense South Africa's racial situation.

Troubling investors: that similar turbulence might crop out at any time in any of the so-called developing nations, upsetting political and economic patterns.

About \$350 million is invested in South African business by about 175 U.S. firms, mainly in mining, smelting, petroleum and distribution enterprises.

Among U.S. companies' projects under way in South Africa:

 Phillips Petroleum is constructing a carbon black plant near Fort Elizabeth.

- Minnesota Mining and Manufacturing is building a plant near Johannesburg for its Scotch-brand products.
- Biltrite Rubber is proposing a plant for shoe and industrial rubber products at an undisclosed site.
- The Burgess Battery Co. (Freeport, Ill.) is building a factory to produce dry batteries.

And Industrial Development Corp. of South Africa reportedly is seeking U.S. technical know-how for its multimillion-dollar synthetic rubber plant.

So far, South Africa's bloodshed has had little immediate impact on chemical process industries projects in the dominion. CHEMICAL WEEK correspondent Norman Herd cabled from Johannesburg late last week that no chemical plant has been seriously affected by the disturbances, although some absenteeism of workers has been noted.

Situated near the principal trouble spot, Sharpeville, but reportedly continuing operations, are the state-owned Coal, Oil and Gas Corp. (SASOL) and producers of a wide range of base products for the chemical and allied industries. Chemical and fertilizer plants in Cape Province also are reported unaffected so far.

South African mining stocks have fallen sharply on both London and Johannesburg stock exchanges. But the chemical sector of the market is said to be "comparatively lively." According to reports late last week, prospective investors from the U.S. were not backtracking on their plans. "Unless the situation deteriorates sharply in the near future," Herd reports, "future stability and prosperity on a new plane are anticipated."

It's still felt that U.S. chemical industry is likely to achieve its target of \$280 million invested there in the next decade for raw-materials projects.

One leading U.S. company that produces mining and agricultural chemicals in the trouble area says that no U.S. firm of long-standing investment and an established reputation is greatly concerned at present. Working conditions at U.S. companies' plants, he added, are considered to be good.

(All dollar figures in millions)

#### New Growth Spurred by '59 Boom

How last year's unprecedented business boom will affect this year's chemical business is becoming clearer as the last of the annual company reports for '59 dribble in. They show that the enlarged research and investment programs begun last year will be continued in '60.

Here are more details of how '59's peak sales and earnings (table, right) have put most chemical companies on new pathways:

• Among the 22 industrial chemical producers that have just reported their latest R&D figures, combined total for '59 was up 7.4%, to \$289 million. Many of these companies have indicated that further increases are in store for this year.

• Funds have been accumulating for new investment programs, such as construction, modernization and acquisition. Contributing to the build-up in internal resources: steadily increasing set-asides for depreciation, amortization and depletion; a decided downturn in capital spending last year. Many companies increased their retained earnings, which resulted from last year's big improvement in profit ratios and a relatively moderate increase in dividend payments.

• Mounting production costs are providing an intensifying stimulant to invest in more efficient productive systems. Typical tactics include vertical integration, improved processes and greater automation. Total costs of goods and services rose 10% in '59 for 12 larger chemical companies; for 14 medium-size concerns, the rise was 12.6%.

Spread out among 20 or so companies, a \$20-million hike in research spending, or an even larger increase in depreciation set-asides, may not make much difference in rate of corporate or industry growth during any one year. But by tending to move those companies into new budget practices, with greater capabilities for discovery and expansion, last year's bounty can be expected to influence industry growth and new-product development for some years to come.

| '59<br>Sales                                      |         | nange<br>m '58 | '59<br>Total   |      | hang<br>om '5 |
|---|---------|----------------|----------------|------|---------------|
| Sales more than \$200 m                           | illion/ | year:          |                |      |               |
| Air Reduction 200.6                               |         | 14.4%          | 157.2          | Up   | 14.3          |
| Allied Chemical 719.7                             |         | 13.2%          | 568.6          | Up   | 9.8           |
| American Cyanamid 583.6                           | Up      | 11.1%          | 444.4          | Up   | 6.8           |
| Celanese Corp. 265.2                              | Up      | 18.6%          | 199.0          | Up   | 13.7          |
| Dow Chemical (1) 705.4                            | Up      | 10.9%          | 498.0          | Up   | 7.7           |
| Du Pont 2,114.3                                   | Up      | 15.6%          | 1,436.2        | Up   | 7.0           |
| Hercules Powder 283.6                             | - 8     | 19.9%          | 221.8          | Up   | 16.1          |
| Monsanto (4) 615.4                                |         | 12.3%          | 532.2          | Up   | 8.8           |
| Olin Mathieson 702.0                              |         | 16.7%          | 588.7          | Up   | 9.4           |
| Rohm & Haas 215.9<br>Stauffer Chemical 228.1      |         | 22.2%          | 152.2<br>188.4 |      | 14.5          |
| Union Carbide 1,531.3                             |         | 7.6%           | 1,083.1        | Up   | 5.1           |
|   | -       | 15.1%          |                |      | 15.8          |
| 12 Large Co.'s 8,165.1<br>8 Large Companies       | Up      | 15.1%          | 6,069.8        | Up   | 10.0          |
| 9 Large Companies                                 |         |                |                |      |               |
| Sales of \$50-150 million                         | n/vear  |                |                |      |               |
| American Potash 54.6                              |         | 14.0%          | 46.9           | Un   | 11.9          |
| Atlas Powder 70.7                                 |         |                | 59.9           | Up   | 6.4           |
| Canadian  | -1      | 70             |                |      |               |
| Industries Ltd. 149.0                             |         | 5.8%           | 126.7          | Up   | 2.7           |
| Commercial Solvents 70.4                          |         | 8.7%           | 59.2           | Up   | 5.0           |
| Diamond Alkali 137.9                              |         | 20.8%          | 110.6          | Up   | 13.5          |
| Du Pont of Canada 90.9                            |         | 11.3%          | 69.6           | Up   | 5.5           |
| Harshaw Chemical (6) 70.0                         |         | 16.8%          | 64.8           |      | 15.0          |
| Heyden Newport 55.9                               |         | 16.8%          | 51.0           |      | 13.2          |
| Hooker Chemical (7) 149.8                         | Up      | 19.3%          | 113.3          | Up   | 17.7          |
| Intern'l. Minerals & Chemical (8) 112.6           | Ha      | 8.6%           | 97.1           | He   | 0.0           |
| Pennsalt Chemicals 87.5                           |         | 11.4%          | 71.3           | Up   | 10.6          |
| Pittsburgh Coke 70.0                              |         | 53.8%          | 59.8           |      | 53.8          |
| Reichhold Chemicals 93.6                          |         | 26.4%          | 86.7           |      | 26.8          |
| Wyandotte Chemicals 93.9                          |         | 14.3%          | 75.8           | Up   | 8.7           |
| 14 Medium Co.'s1,306.8                            | Up      | 15.4%          | 1,092.7        | Up   | 12.6          |
| 9 Medium Companies                                |         | 70             |                |      |               |
| 7 Medium Companies                                |         |                |                |      |               |
| Sales of \$1-20 million/y                         | ear:    |                |                |      | •             |
| Carwin Co. 3.0                                    | Up      | 30.6%          | 2.5            | Up   | 27.7          |
| Chemical Process Co. 5.1                          |         | 28.5%          | 4.4            | Up   | 26.0          |
| Cowles Chemical 8.6                               |         | 12.3%          | 7.7            | Up   |               |
| Metal Hydrides 5.9                                |         | 81.1%          | 5.2            |      | 92.3          |
| Michigan Chemical (9) 8.6                         | Down    | 7.1%           | 7.2            | Down | 7.9           |
| Stepan Chemical (10) 19.4<br>6 Smaller Co.'s 50.6 |         |                | 43.7           | _    |               |
| O Smaller Co. 5 30.0                              |         |                | 45.7           |      | No.           |
| Pharmaceutical manufac                            |         |                |                |      |               |
| Abbott Laboratories 122.6                         |         | , .            | 96.0           | Up   |               |
| Lilly, Eli 187.0                                  |         |                | 136.0          | Up   |               |
| Merck & Co. 216.9                                 |         |                | 168.8          | Up   |               |
| Parke, Davis & Co. 191.5<br>Pfizer, Chas. 253.7   |         | 11.0%<br>13.9% | 127.0<br>220.6 | Up   | 17.2          |
| Pfizer, Chas. 253.7<br>Searle, G. D. 34.5         |         |                | 19.0           | Up   |               |
| Smith Kline                                       | op      | 3.0 70         | 13.0           | Op   | 7             |
| & French 134.9                                    | Up      | 8.7%           | 82.0           | Up   | 6.0           |
| Sterling Drug 228.8                               |         |                | 169.1          | Up   |               |
| 8 Drug Co.'s 1,369.9                              |         |                | 1,018.5        | Up   |               |
| 3 Drug Companies                                  | -1      | 70             | ,              | -1-  |               |

N.R.—not reported. N.S.C.—no significant change.
(1) For fiscal year ended May 31. (2) Excluding employees at government-owned plants. (3) On operating income only. (4) U.S. and Canadian opera-only. (5) No significant change in dollar volume of research work under

#### **CURRENT MONEY TRENDS: MOST OUTLAYS ARE UP**

| <b>Expenditures</b> fo | r Goods | and S | Services |
|------------------------|---------|-------|----------|
|------------------------|---------|-------|----------|

| Employ-<br>ment<br>Costs | Change<br>from '58 | Research<br>Dvlpt.<br>Costs | h<br>Change<br>from '58 | Taxes<br>on<br>Income | Change<br>from '58 | Cash<br>Divi-<br>dends | Change<br>from '58  | Capital<br>Expendi-<br>tures | Change<br>from '58 |
|--------------------------|--------------------|-----------------------------|-------------------------|-----------------------|--------------------|------------------------|---------------------|------------------------------|--------------------|
|                          |                    |                             |                         |                       |                    |                        |                     |                              |                    |
| 53.8                     | Up 9.1%            | 6.5                         | Up 36.9%                | 16.2                  | Up 21.4%           | 9.8                    | N.S.C.              |                              | 38.8%              |
| 199.8                    | Up 10.6%           | 17.0                        | Up 6.2%                 | 44.4                  | Up 82.0%           | 31.3                   | Up 5.0%             | 40.8 <b>Down</b>             | 30.2%              |
| N.R.                     |                    | 26.1                        | Up 11.8%                | 51.2                  | Up 33.0%           | 33.9                   | N.S.C.              | 35.5 <b>Down</b>             | 58.5%              |
| 83.3                     | Up 11.4%           | 5.5                         | Down . 2.8%             | 23.6                  | Up 72.9%           | 11.3                   | Up 7.1%             | 12.5 Up                      |                    |
| 192.0                    | Down 3.3%          | N.R.                        |                         | 53.2                  | Up 25.5%           | 31.4                   | N.S.C.              | 59.0 <b>Down</b>             | 68.1%              |
| 677.0 (2)                |                    | 90.0                        | N.S.C.                  | 276.4 (3)             | Up 59.0%           |                        |                     | 174.0 <b>Down</b>            |                    |
| 82.5                     | Up 12.8%           | 11.6                        | Up 7.4%                 | 25.6                  | Up 34.0%           | 11.4                   | Up 17.9%            | 20.8 Up                      | 48.6%              |
| N.R.                     | 100                | 26.9                        | Up 15.0%                | 36.8                  | Up 59.3%           |                        | N.S.C.              | 58.0 Up                      | 36.2%              |
| N.R.                     |                    | N.R.                        | Up (5)                  | 33.8                  | Up 317.3%          | 13.3                   | Down 33.3%          | 30.2 <b>Down</b>             | 37.3%              |
| 53.6                     | Up 14.9%           | N.R.                        |                         | 26.2                  | Up 66.2%           | 3.5                    | Up 47.7%            | 19.0 <b>Up</b>               | , -                |
| N.R.                     |                    | 4.7                         | Up 9.4%                 | 20.4                  | Up 25.4%           |                        | Up 124.2%           | 14.4 Down                    | 8.4%               |
| 414.0                    | Up 0.5%            | 79.0                        | Up 11.3%                | 163.5                 | Up 39.7%           |                        |                     | 136.6 Down                   | 5.1%               |
|                          |                    |                             |                         | 771.3                 | Up 52.7%           | -                      |                     | 631.9 <b>Down</b>            |                    |
| 1,756.0                  | Up 3.8%            |                             |                         |                       | 70                 |                        |                     |                              | 70                 |
| 20.0                     | 7.0                | 267.3                       | Up 7.2%                 |                       |                    |                        |                     |                              |                    |
|                          |                    |                             | 70                      |                       |                    |                        |                     |                              | 12.5               |
| N.R.                     |                    | N.R.                        |                         | 2.7                   | Up 29.5%           | 2.7                    | Up 9.0%             | 4.2 Down                     | 35.4%              |
| 23.4                     | Up 10.3%           | 3.6                         | Up 9.1%                 | 3.7                   | Up 20.0%           |                        | N.S.C.              | 4.2 Down                     |                    |
|                          | Jp 40.3%           | 3.0                         | Jp 3.1%                 | 3.7                   | Sp 20.0%           | 1.0                    | .1.5.0.             | THE DOWN                     | 70                 |
| N.R.                     |                    | N.R.                        |                         | 5.3                   | Up 141.3%          | 4.5                    | N.S.C.              | 7.0 Down                     | 39.7%              |
| 12.7                     | Up 1.4%            | N.R.                        |                         | 4.8                   |                    |                        |                     | 1.4 Down                     |                    |
| 38.6                     | Up 1.4%            | N.R.<br>4.0                 | Un 0.20/                | 4.8<br>11.5           | Up 66.4%           |                        | Down 9.1%<br>N.S.C. | 9.5 Up                       |                    |
| 38.6<br>N.R.             | Jp 2.4%            |                             | Up 9.3%                 |                       | Up 101.0%          |                        |                     | 9.5 Up                       |                    |
| N.R.<br>14.2             | lin 19 70/         | N.R.<br>2.1                 | Ho 16 104               | 7.9                   | Up 63.5%           |                        | N.S.C.              | 10.4 Down                    |                    |
| 13.7                     | Up 18.7%           | 2.1                         | Up 16.1%                | 2.3                   | Up 61.1%           |                        | Up 10.3%            | 1.1 Down<br>3.0 Up           |                    |
| 34.4                     | Up 4.1%<br>Up 9.6% | 1.4<br>3.7                  | Up 11.5%                | 2.7                   | Up 109.6%          |                        | Down 18.5%          | 3.0 Up<br>7.1 Down           |                    |
| 54.4                     | op 9.6%            | 3./                         | Up 3.9%                 | 13.5                  | Up 41.7%           | 7.5                    | Up 6.2%             | 7.1 DOWN                     | 11.9%              |
| 30.7                     | Up 5.9%            | 3.0                         | N.S.C.                  | 1.2                   | Un 16 50/          | 4.1                    | N.S.C.              | 13.9 Up                      | 44.4%              |
| 21.3                     |                    |                             | 14.5.0.                 |                       | Up 16.5%           |                        |                     |                              |                    |
|                          | Up 8.4%            | N.R.                        |                         | 5.3                   | Up 70.2%           |                        | Up 9.0%             | 8.0 Down                     |                    |
| 13.5<br>N.R.             | Up 11.8%           | N.R.                        | He 20 co.               | 3.1                   | Up 79.2%           |                        | N.S.C.              | 3.1 Down                     |                    |
| N.R.                     |                    | 2.1<br>N R                  | Up 20.0%                | 2.6                   | Up 13.7%           |                        | Up 58.8%            |                              | 141.3%             |
| 14.17.                   |                    | N.R.                        |                         | 4.1                   | Up 76.3%           |                        | N.S.C.              | 9.8 Down                     |                    |
| 200 -                    |                    |                             |                         | 70.7                  | Up 62.5%           | 40.0                   | Up 2.6%             | 94.1 <b>Down</b>             | 6.6%               |
| 202.5                    | Up 7.4%            |                             |                         |                       |                    |                        |                     |                              |                    |
|                          |                    | 19.9                        | Up 8.7%                 |                       |                    |                        |                     |                              |                    |
|                          |                    |                             |                         |                       |                    |                        |                     |                              | 40.                |
| N.R.                     |                    |                             | Down 5.8%               | 0.2                   | Up 27.0%           |                        | Up 8.4%             |                              | 42.2%              |
| N.R.                     |                    | 0.2                         | Up 16.8%                | 0.4                   | Up 48.3%           |                        | -                   |                              | 258.1%             |
| 2.1                      | Up 12.5%           | 0.3                         | Up 12.0%                | 0.3                   | Up 85.0%           | 0.1                    | Up 3.1%             |                              | 24.8%              |
| 1.2                      | Down 19.6%         |                             | Up 51.3%                | 0.01                  | (11)               |                        |                     |                              | 13.4%              |
| 2.5                      | Up 6.1%            | 0.4                         | Down 6.7%               | 0.25                  | Down 16.7%         | 0.2                    | Up 4.2%             |                              | 382.7%             |
| 3.0                      |                    | 0.4                         |                         | 0.8                   |                    |                        |                     | 0.5                          |                    |
| _                        |                    | 1.8                         |                         | 2.0                   |                    | -                      |                     | 6.9                          |                    |
| A CONTRACTOR             |                    |                             |                         |                       |                    |                        |                     |                              |                    |
| 39.1                     | Up 6.9%            | 6.9                         | Up 20 %                 | 11.3                  | Down 3.6%          | 7.5                    | N.S.C.              | 10.3 U                       | 20.8%              |
| N.R.                     | 0.0/0              | 18.3                        |                         |                       | N.S.C.             | 20.0                   | Up 25.2%            |                              |                    |
| 75.9                     | Up 11.0%           |                             | Up 8.8%                 |                       | Down 14.2%         |                        | Up 13.4%            |                              |                    |
| 53.5                     | Up 10.8%           |                             | Up 13.0%                |                       | Up 14.4%           |                        | Up 30.3%            |                              | 32.2%              |
| N.R.                     | -1 -0.0/0          |                             | (12) Up 27.4%           |                       | Up 19.4%           |                        | Up 7.5%             |                              |                    |
| N.R.                     |                    | N.R.                        | -P =1.4%                | 7.4                   | Up 19.4%           |                        | N.S.C.              |                              | 53.2%              |
|                          |                    |                             |                         |                       | 2.0%               | 5.5                    |                     |                              | /6                 |
| N.R.                     |                    | 12.1                        | Up 12.0%                | 26.9                  | Up 11.0%           | 17.4                   | Up 38.5%            | 4.6 Up                       | 91.7%              |
| N.R.                     |                    | N.R.                        | /0                      | 21.9                  | Up 20.3%           |                        | Up 10.3%            |                              | 22.4%              |
|                          |                    |                             |                         |                       |                    |                        | Up 18.2%            |                              |                    |
| 169 =                    | IIn Once           |                             |                         | 156.7                 | Up 2.2%            | 113.7                  | ор 18.2%            | 88.9 Up                      | 0.8%               |
| 168.5                    | Up . 9.9%          |                             | 11-15-1-                |                       |                    |                        |                     |                              |                    |
|                          |                    | 80.3                        | Up 15.9%                |                       |                    |                        |                     |                              |                    |

government contract, but a "substantial" increase in company's own research activity. (6) For fiscal year ended Sept. 30. (7) For fiscal year ended Nov. 30. (8) For fiscal year ended June 30. (9) Data for two years not strictly comparable because company terminated its DDT operations at the end of '58. (10) Data for '59 include operations of Maywood Chemical Works following its acquisition May 1, comparable data for '58 not reported. (11) No federal income tax liability in '58. (12) Including work under government contract for cancer research.

#### **UOP Builds Chemical Base**

Universal Oil Products' drive for diversification took a distinctly chemical twist last week, when UOP acquired Trubek Laboratories (East Rutherford, N.J.), a synthetic chemicals manufacturer, with '59 sales of nearly \$6.7 million and profits of \$286,016.

Trubek Laboratories, founded and wholly owned by Rob Trubek, first made and sold "aroma" chemicals (as he calls them) to dealers in 1932. Since then, he states, the company "just wasn't for sale."

Maynard Venema, president of Universal Oil, tells CHEMICAL WEEK: "Trubek's reputation — particularly in soaps and additives — will be a distinct advantage to UOP. And we intend to keep the Trubek name, as well as its present management." The only change so far: the Trubek board of directors now will have seven members, four of them UOP executives.

"A whirlwind courtship" is how Trubek describes the merger. But his decision to sell was not hastily arrived at — even though Trubek admits that, for several years, he realized that merger or public stock issue was "inevitable." The actual acquisition was strung out over a two-year period.

Two weeks ago, UOP purchased 51% of the stock, a year from now it will get 29% more and the remainder in two years. Estimated total cost to UOP: around \$6 million, with exact cost dependent upon Trubek Labs' performance. Venema stresses that the total payment will come from UOP-generated funds.

What does UOP plan for Trubek Labs? Venema says that his company has developed a number of products remote from its basic interest area. These products are potential profitmakers, provided the right company could be acquired to develop them. Product research and application then was the key factor to UOP's decision to purchase Trubek.

And Trubek could even become a source of supply on "some items now purchased outside," according to Venema.

Possibility: UOP's Sustane line (butylated hydroxyanisole) might be

made by Trubek, but no decision on this has yet been reached.

Meanwhile industry sources speculate that UOP is thinking chiefly in terms of high price/pound, relatively small-production items. It's hinted that UOP research in gas sweeteners and additives has yielded potential specialties, drugs, and feed additives. On this, Venema won't comment.

One problem that won't be solved for a year at least, according to Trubek, is the eventual location of Trubek's research facilities-whether at East Rutherford or Des Plaines, Ill. Trubek holds that UOP's and Trubek's research facilities "in the organic field alone" are about the same size. Trubek, prior to acquisition, had purchased a 92-acre site in Hunterdon County (township of Readington, N.J.) across the river from Bucks County, Pa. Here the company intended to build new research facilities, and it's here that Trubek is still hoping to center research activities.

One feature of the outlook is clear, however: UOP will not make any move that would place it in competition with its big customers in the oil and chemical industry. And it's a good bet that any new ventures will also be compatible with UOP's hydrocarbon oils interests.

UOP has reported that its '59 net earnings — from Feb. 12, '59, the start of operations in its present corporate form, until the year end — totaled \$3.3 million. Total sales were \$17.7 million; construction contract income before general expenses, \$26.4 million.

UOP's manufactured products fall into two very broad classifications: (1) catalysts and (2) rubber, food and gasoline additives; sales of these are reportedly increasing. But the largest segment of its income is Universal's process licensing and corollary activities. UOP's new Lomax process (CW, Technology Newsletter, April 2), for example, could substantially improve the economics of refinery operations, UOP believes.

In his annual report to stockholders, UOP board chairman David Harris also stressed Trubek's future role in helping UOP grow as a chemical producer. He added that even

further acquisition possibilities are being explored in fields where "UOP's research orientation can contribute to growth."

Looking back on the long road the company has traveled since '32, Trubek's vice-president of operations, Harry Hachem, says: "There's no one-package company like it." Its three main activities:

(1) Synthetic organic "aroma" chemicals (sold only on a dealer basis until '58).

(2) Nonaromatic intermediate production and sales (acquired with the absorption of Harold L. Simons, Inc., and George G. Fries Co., Inc., in '48).

(3) Truland Chemicals, division of Trubek, which pioneered electronically controlled distillation (CW, Oct. 19, '57, p. 61). Acquisition of Truland as a Trubek Division was a big change for the company — it meant low-unit, large-volume operation for the first time, led to its present sevenday work week. Trubek now has more than 400 products.

#### **AEC's Search Goes On**

Once again, the Atomic Energy Commission is seeking a site for a dual southern California project: a nuclear reactor to provide process heat and a salt-water distillation plant. The latter would utilize heat from the former.

Two previously considered sites— Hueneme and Camp Pendleton are back in the running after AEC's advisory committee on reactor safeguards ruled out construction of the \$6.5-million plant in the Point Loma section of San Diego.

That committee reasoned that an unproved low-temperature processheat reactor — first of its kind to be slated for construction (CW Technology Newsletter, Aug. 22, '59)—posed too great a danger to San Diego's large population. The advisory committee says it considers Point Loma to be a poor site because of "unfavorable meteorology and high population density, aggravated by recreational and fisheries aspects and lack of ocean dilution."

AEC reactor experts who had chosen the Point Loma site are still unconvinced. They believe the 40-mw. (thermal) reactor, supplying steam at 380 F, could be safely constructed

and operated at any location.

Had the point been acceptable to all concerned, construction was to start in April.

Government officials are said to lean toward Camp Pendleton on the basis of low population (about 4,000). However, the city of Oxnard has offered land at the Hueneme site. California government officials feel that neither AEC nor the Dept. of Interior's Office of Saline Water are likely to split up the project or shift it from California. (The state will put up \$1.5 million as a contribution toward the project.) "But if any more serious snags occur," according to one Interior staffer, "we'll go ahead with the distillation unit, but use conventional steam and not bother with nuclear heat."

#### **DDT Foes Find Friend**

Although the opponents of aerial pesticide spraying failed last week to get the U.S. Supreme Court to hear their case, they got encouragement from one justice. And the manner in which the high court disposed of their case may leave them in better position to attack mass spraying on some future occasion.

In last week's development, the Supreme Court simply refused to review last fall's ruling by the circuit court in New York concerning the government's aerial spraying of DDT to fight gypsy moths on Long Island. So the circuit court's holding still stands — that there's no use to ask for an injunction after the spraying is all over, but that, when mass spraying is to be started again, an application for an injunction should be considered on its merits.

After that ruling, the plaintiffs — Long Island residents who objected to having their homes and farms included in the mass spraying program — brought their case to the Supreme Court, contending that Constitutional issues were involved. By 8-to-1 vote, the high court turned down the appeal.

The dissenter was Justice William Douglas, who insisted in a six-page memorandum that the issues were important enough to warrant a full review. His strong interest may encourage pesticide foes to launch new attacks in state or federal courts whenever they have a chance.

#### Taking Two Steps at Once

Engelhard Industries—for decades a leading dealer, refiner and manufacturer in the field of precious metals, with sideline operations in chemicals, catalysts, other products—is making news this week on Wall Street and on the international atomic energy scene.

 Here at home, Engelhard, a closely held, family-managed firm since 1903, with headquarters in Newark, N.J., is going public.

• On the international scene, it's teaming up with Montecatini (Italy), the Anglo-American Corp. of South Africa and Mallinckrodt Chemical Works (St. Louis) to produce nuclear fuel materials through Italatom (Milan), a new joint subsidiary.

Nuclear Fuel Push: The new Italian-based firm will be operated and 50%-owned by Montecatini. Mallinckrodt, a long-time commercial producer of nuclear fuels, and Engelhard will both contribute technical know-how. All three companies will nominate representatives to the board of directors.

Mallinckrodt says Italatom will produce and sell nuclear fuels both in and outside the Euratom sphere. And, depending on requirements of reactor projects, Italatom will manufacture natural, depleted and enriched uranium and thorium compounds as well as uranium metal.

Engelhard recently began making nuclear fuels, fuel elements and what it describes as "certain other products for nuclear use" at its Plainville, Mass., plant. The company declines to comment on its part in the upcoming international nuclear fuels production facility. But it's known that Engelhard's Irvington-Baker Refining Division has process know-how in uranium scrap recovery as well as in nuclear fuel work.

Going Public: Meanwhile, Engelhard is making news in financial circles. In a preliminary prospectus, the company is proposing to sell to the public 400,000 shares of new common stock. To understand what effect this would have on present owners' holdings, it's helpful to examine the firm's corporate setup.

Until '58, the business consisted of separate but "intertwined" operating companies. Then, in a move to make the unwieldy apparatus more manageable, Engelhard Industries was incorporated in New Jersey. It consolidated most of the Engelhard units. Now a new company with that same name has been incorporated in Delaware as a wholly owned subsidiary of New Jersey's Engelhard Industries. The New Jersey parent company—now renamed Engelhard Hanovia, Inc.—will serve mainly as a holding company. The Delaware corporation will be the principal operating company.

When the proposed 400,000 shares are sold to the public, Engelhard Hanovia's ownership in the operating company will be cut from 100% to

At the date of the prospectus, C. W. Engelhard, director, chairman and president of the company, owned 50.1% of Hanovia's Class A common stock. All together, Hanovia stock owned by members of the Engelhard family, or held in trust for them, included 70.5% of Class A common, 74.1% of Class B common, 87.3% of the preferred shares.

Chemicals Climb: Although Engelhard's main source of sales revenue is still in specialized mill and fabricated products (33%), its line of chemicals—catalysts, chemicals, plating compounds and solutions—has climbed to 15% of net sales volume. Net sales for '59 amounted to \$126.7 million, compared with \$99.1 million in '58. Net income jumped from \$509,663 in '58 to \$3.7 million last year.

Engelhard is placing great stress on its research program. Among current projects: basic research in precious-metal metallurgy, applications of precious metals where resistance to high temperature and corrosion are needed, and development of new precious-metal catalysts. In '59, the company spent nearly \$1.7 million on research and development.

Capital expenditures over the past five years totaled \$13 million, including a \$2.4-million outlay for a plant acquisition in '56.

Of net sales in '59, nearly 20% went to customers in the electrical and electronics industries. The chemical and pharmaceutical industries took 12%.

#### COMPANIES

Foster D. Snell, Inc. (New York), has acquired Sperling Laboratories (Arlington, Va.) to supplement its services in pharmacology and toxicology. The consulting firm plans to eventually consolidate Sperling into its expanded Baltimore Division, Crippen Laboratories.

Big Horn Gypsum Co. (Salt Lake City) is building a \$3-million gypsum board plant in Cody, Wyo., on the site of the old Texas Sulphur plant. Gypsum board (100 million ft./year) from the completed plant will supply customers in 10 states.

Jefferson Lake Sulphur Co. (New Orleans) and Transcontinental Gas Pipe Line Corp. have formed a new company, Trans-Jeff Chemical Corp. (Houston, Tex.). First undertaking of the new firm: a sulfur recovery plant near Tilden, Tex., where Transco operates a gas-treating plant to remove impurities from sour gas. Trans-Jeff will recover sulfur from waste acid gas stream. Other chemical product manufacture is being considered.

Collier Carbon and Chemical Corp. has awarded a contract to Leonard Construction Co. (Chicago) to build a Leonard-Monsanto contact sulfuric acid plant in the Los Angeles area by late '60. Initial rated plant capacity: 250 tons/day, using spent alkylation acid, hydrogen sulfide and sulfur as raw materials.

#### EXPANSION

Polyurethane Foam: Armour Alliance Industries (Alliance, O.), a division of Armour & Co., will produce flexible polyurethane foams at a plant in Los Angeles expected to start up early next month. Additional decentralized foam plants also reportedly are under study. The Los Angeles "one-shot" foaming machine's capacity: 4,000 lbs./hour.

Paper: Southern Timber, Land and Pulpwood Corp. (Manchester, Ga.) reportedly is considering Georgetown, Ga., for location of a \$40-million paper mill.

Polyethers: Wyandotte Chemicals (Wyandotte, Mich.) is considering purchase of a plant site in Washington, N.J.—its first move eastward. If negotiations are successful, the company will put up facilities to produce a broad line of polyether products used in manufacture of synthetic household cleaning and washing products and in flexible and rigid polyurethane foams.

**Pharmaceuticals:** Smith-Dorsey Co. (Lincoln, Neb.) will double its facilities by constructing a building on a newly purchased 142-acre tract outside Lincoln. Land cost \$100,000, but cost of the facility has not been

estimated. The firm is a subsidiary of Wander Co. (Berne, Switzerland).

Synthetic Rubber: Texas-U.S. Chemical Co. will expand by 10% its Port Neches, Tex., copolymer plant mainly by adding new drying and carbon masterbatch facilities. Capacity will be approximately 156,000 tons/year. Completion target: late '60, with full production slated for early '61.

#### FOREIGN

Synthetic Latexes/England: Witco Chemical Co., Ltd., (London), wholly owned subsidiary of Witco Chemical (New York), will build an 8-million-lbs./year synthetic rubber latex facility on a 20-acre site in the English Midlands. The plant, scheduled for completion in early '61, will produce butadiene-styrene, high styrene, nitrile and other acrylic types of latexes.

Polyethylene/Japan: Stone & Webster (New York) is designing Mitsubishi Petrochemical's second ethylene plant, to be located at Yokkaichi near Nagoya. Completion is scheduled for '61, and output will be used for producing conventional polyethylene. The first ethylene facility at this site was completed by S&W last spring.

Sulfuric Acid/Holland: Albatros Sulfuric Acid and Chemical Works (Vlaardingen, Holland) has awarded two contracts to Chemical Construction (G.B.) Ltd. One project involves engineering and construction of a sulfuric acid contact plant (capacity: more than 100,000 metric tons/year) to make sulfuric acid gas from pyrites. The second plant will decompose sulfuric acid refinery sludge from an adjacent Shell refinery. Albatros Sulfuric Acid is a new company, jointly owned by Albatros Superfosfaatfabrieken N.V. (Utrecht) and Cyprus Mines Corp. (Los Angeles). Chemical Construction Ltd. is the British subsidiary of Chemical Construction Corp. (New York).

Industrial Chemicals/Australia: Hercules Powder Co. and A. C. Hatrick Pty., Ltd., an Australian company, will organize a jointly owned firm to be known as Hercules Powder Co. (Australia) Pty., Ltd., to provide rosin derivatives and other industrial chemicals for sale in Australia and New Zealand.

Petrochemicals/Scotland: British Hydrocarbon Chemicals will build three plants at its Grangemouth, Scotland, petrochemical complex: one plant to more than double existing capacity for butadiene, one for methanol, and one for production of ethylene dichloride. The plants will cost about \$14 million, will make fuller use of the company's third cracking unit scheduled to come into operation later this year with a capacity of 70,000 long tons/year of ethylene.

#### Washington

#### Newsletter

CHEMICAL WEEK April 9, 1960 A bill to require warning labels on an estimated 300,000 household products that are potentially dangerous or toxic is expected to become law before Congress adjourns. It has already passed the Senate—without discussion or dissent—and hearings have been completed in the House. Subcommittee Chairman Kenneth Roberts (D., Ala.) expects to report on it as soon as his committee can meet in executive session.

Still to be decided are two points: whether to include food, drugs and cosmetics, which are already covered extensively under other laws; whether to permit FDA inspectors to enter factories. FDA wants both; the Senate bill includes only the first.

The bill means that new labels would have to be designed for many flammable or toxic household items. It would be the first labeling measure of these products since the Federal Caustic Poison Act of 1927, which covered only 12 chemicals. Labels would have to say "danger," "warning," or "caution"; state the hazard; give precautionary measures and antidotes; and show the word "poison" on anything defined as highly toxic.

One argument behind the bill: National Clearing House for Poison Control Centers says 400 children die each year from eating or drinking ordinary "household chemicals."

Protests against indiscriminate use of pesticides in wildlife areas have resulted in a bill introduced by Rep. Leonard G. Wolf (D., Ia.) that requires federal agencies using insecticides on a large scale to consult first with the Fish and Wildlife Service. Wolf cites several reasons for his bill: kills of trout in Montana from DDT; too strong doses of heptachlor and dieldrin used in killing fire ants, which also kill birds and fish; the possible hazard to humans from game which contain residues of such chemicals.

Research on food irradiation is still a live project with both the Army and the Atomic Energy Commission.

Last fall the Army cancelled construction of a \$7.5-million proposed ionizing radiation center at Lathrop, Calif., but R&D Chief Richard S. Morse now tells Congress the Pentagon has approved an experimental radiation preservation program aimed at solving problems of wholesomeness and storage of irradiated food. The Army's '61 budget will propose \$500,000 for the wholesomeness studies and another \$500,000 for storage studies. The program is designed to resolve technical problems associated with high-dose radiation treatment (sterilization) of pork, smoked ham, chicken and beef. Secondary emphasis will be placed on low-dose-treated (pasteurized) food items such as fish and fruits.

#### Washington

#### Newsletter

(Continued)

AEC will also earmark \$500,000 for research in low-dose pasteurization but will spend even more over the next six years in high-dose studies. The agency hopes to phase its efforts into civilian and industrial activities, once the basic research problems have been successfully resolved.

A hike in lead-zinc import tariffs is in the works, but it's likely to come only as a replacement for current import quotas, and then at a level considerably lower than domestic producers have been asking—somewhere in the neighborhood of 2e/lb.

The picture became clearer last week, when the Tariff Commission split 4-2 against recommending tighter lead-zinc tariff protection to Congress. In a general report on the domestic industry ordered by the Senate last summer, the majority refused to come up with any recommendations, holding the commission did not have the authority under the section of the law used to direct the study.

A new increased duty rate of  $3\phi$  on lead and  $2\frac{1}{2}\phi$  on zinc was proposed by the dissenting commissioners, Walter Schreiber and Glenn Sutton.

But the minority urged that the new rates replace present quotas. This is what the Administration is considering doing when the quotas come up for routine review in the fall. The White House increase, however, is expected to be lower than that recommended by the commission minority. Current rates range betwen  $34 \, \phi$  and  $1\frac{1}{4} \, \phi$ .

Meanwhile, mining-state congressmen will push for a new legislated tariff of at least  $3\phi$ —also as a substitute for the quotas. But this drive is given only an outside chance of passage at best, as is a move to pass a new, government price subsidy bill supporting small mines production of lead at  $17\phi$  and zinc at  $14\frac{1}{2}\phi$ .

Jess M. Ritchie is again having troubles with FTC about his battery additive AD-X2. The commission doesn't like the way the additive is being advertised. Monday it issued a complaint, stating that claims that the product has been "proved before the Federal Trade Commission" and is "government tested and proved" are false. The complaint cites Pioneers, Inc. (Oakland, Calif.) and its president, Ritchie.

"The product has not been approved before FTC, tested or approved by the commission, or approved after tests by a federal agency," FTC says.

Previously the commission complained against claims that AD-X2 extended life of batteries, but dropped the case after Ritchie was able to marshal from users a volume of testimonials in his behalf.

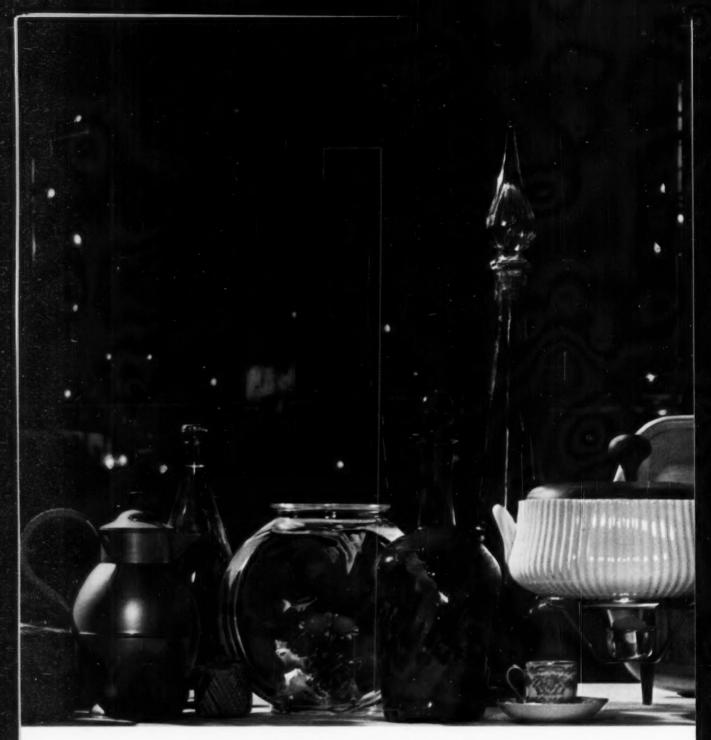


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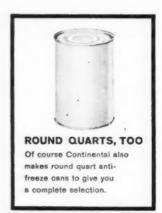
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#### ADMINISTRATION

#### For Older Workers, New Retirement Policy

The probability that the proportion of older employees will grow rapidly in the next decade is prompting CPI management to look for more flexible retirement programs and better ways to utilize the changing manpower force. Heart of the matter can be found in recent predictions, like those of the U.S. Dept. of Labor, of changes in work-force composition and a shortage of certain critical manpower by 1970.

In its forecast for the decade, the Labor Dept. warns that a larger work force, coupled with changes in age distribution, will create swollen ranks of elder employees and shortages of mid-aged people. "Workers 45 and over will increase by about 5.5 million," says Labor Secy. Mitchell, "accounting for more than 40% of the expected growth in the work force of 13.5 million. This is in spite of earlier retirements."

Moreover, says the Labor Dept., the number of workers aged 25 to 44 will show only a relatively small increase. This means that the vital 35- to 44-year-old group, which supplies a large proportion of executives, managers, foremen and highly skilled workers in the CPI, will decrease from today's level by 2 million.

Meeting the Situation: By and large, a CHEMICAL WEEK roundup of 25 large, medium and small chemical firms shows, companies are not decided on how specifically they'll meet the problem, except to say that one approach will be through loosening retirement programs.

The president of one medium-size company expressed the consensus this way: "Our first choice for solving the problem would be to keep our older, more experienced people to fill the gap. In other words, if we had a choice between keeping a healthy man past 65 and hiring a young one to take his place, we would keep the experienced man. Of course, we would hire younger men and probably step up automation, too, but the emphasis would be on the older employees."

Larger companies said they would stress automation first in meeting shortages where hourly workers are Today's CPI Retirement Plans . . .

#### 1. Mandatery

Require employees to retire at a specified age, usually 65. No exceptions unless union requirements vary from company policy.

#### 2. Optional

Permit early or late retirement, varying from ages 55 to 70, often depending on individual cases. May also have official — though nominal — retirement at 65.

#### 3. Automatic

Based on a point system. When points representing length of service and age combine to a certain total, retirement may be either optional or mandatory.

#### 4. Discretionary

Provide for no retirement age. Each case is handled individually, depending on employee, his job and pension program.

#### ... May Yield to Greater Flexibility Tomorrow

CPI companies generally expect the '60s to bring greater flexibility to industry retirement programs. Among developments expected: earlier optional retirement; later mandatory retirement; greater opportunity for older workers; clearer and more definite stands by unions on retirement question. Reasons: possible labor shortages; expanding older population; increased health and longevity; desire to utilize experienced hands.

concerned, but would look to experienced hands to fill out the personnel requirements within existing union arrangements. Most companies are of the opinion that with health and stamina being equal, older workers often have an edge over younger men in comparable jobs, due to experience, maturity and company interest.

Effecting a Solution: Since retirement policies are linen that's seldom aired in public, few companies are willing to be quoted on what trends they see emerging in retirement practices in the CPI. Moreover, there's a wide variety of retirement programs in effect, with little agreement as to the best possible type (see chart). Nevertheless, most companies agree that within the next 10 years, CPI com-

panies will see greater flexibility in retirement programs, designed to meet individual situations.

Said one executive, "We used to have a fairly rigid policy, but it has, for the past three years, grown more and more flexible. Our official company policy is retirement at age 65. But what this means is that if an employee reaches 65—and we've wished for years we could replace him—this is our chance to give him his big send-off party and retire him gracefully.

"But if an employee is 65 and in good health and wants to continue working, we will keep him until he is 70, or even older. We have a salesman right now who is 80 and still going strong. He's in good health, pro-

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#### ADMINISTRATION

ducing, and loves his work. We'd be doing him and the company a disservice by forcing his retirement."

He sums up his company's approach this way: "In the past few years our official rules haven't changed, but our attitude has. We realize that it's desirable to get extra mileage out of those employees who have it and want to give it. When they reach 65, we take a good look at them, sound them out, and make our decision."

Getting More Flexibility: To keep from being bound by outdated retirement policies, companies find that lowering the optional age and/or raising the mandatory age for retiring, provides the flexibility and individuality they want. The personnel director for a large West Coast chemical company now trying this plan points out: "General trends in retirement ages seem to be broken into two distinct camps. You will discover as many for early retirement as for late retirement."

This was borne out by CHEMICAL WEER'S roundup. Whereas the majority of companies said they had no plans to alter retirement programs immediately, they were split about evenly on foreseeing trends toward earlier and later retirement in the industry.

Some companies were emphatic in a no-change policy. For example, M. J. Rathbone, president of Standard Oil Co. (New Jersey), says, "We considered [changing the retirement age] but we've definitely decided against it. We feel very strongly that the mandatory retirement age is a fine thing for the organization."

Reutilization of Manpower: The predicted age flexibility in retirement policies is not the only way companies are preparing for a refocus of the manpower picture. Several companies are placing older employees—both salary and wage—in tapering-off jobs where, for example, less and less day-to-day responsibility is required as retirement age approaches. Many companies are putting more and more qualified people on the payroll as consultants after retirement. A variety of approaches are in effect.

Here's a comment from a large Southwestern oil and petrochemical company that has scored in this area: "We're tending toward earlier retirement ages, and we take retirement to mean relief from day-to-day routine work. Now our mandatory retirement age (for men) is 65. However, at 60-62 we take our top men away from their usual work and make them 'consultants' for the company. Then we give them assignments, as they arise, which require management abilities and responsibilities.

"Recently, we sent one of these people to Japan to look into some market possibilities for us. He was able to talk with top-level people and make on-the-spot decisions for the company without checking back with management. The same was true with a man we sent to Europe. If we didn't have these older consultants, we would have had to send errand-boys who couldn't do nearly as effective jobs as do these older management people.

"So instead of coasting toward retirement, our people look forward to these last three to five years with our company because of the freedom from routine work and the opportunity for very interesting assignments."

Semiretirement: Not long ago, two inspectors at the Jet Propulsion Laboratory in Pasadena, Calif., went into the company's unusual semiretirement program where each works half-time, a month on and a month off. In this way, the company retains the services of two highly specialized individuals, and the employees are not suddenly faced with the prospect of nothing to do.

Other companies permit certain hourly men to downgrade into other jobs after their retirement, and many firms make exceptions to strict retirement rules for especially needy employees. But American Cyanamidwhich a few years ago moved compulsory retirement from 65 to 68 for workers earning less than \$7,500/year-has found that of those who stay on only half remain until 68. The company doesn't know the reason for this, but it believes that once an employee knows he is not being forced to retire, he will decide for himself that he is ready for it.

Some CPI executives agree with R. B. McCurry, president of Schen-Labs Pharmaceuticals, Inc., who takes the strong view that both the individual and the company benefit when there is no mandatory retirement age, when each case is judged individually. He believes that "because of the great differences in men, retirement at a specific age should not be compulsory

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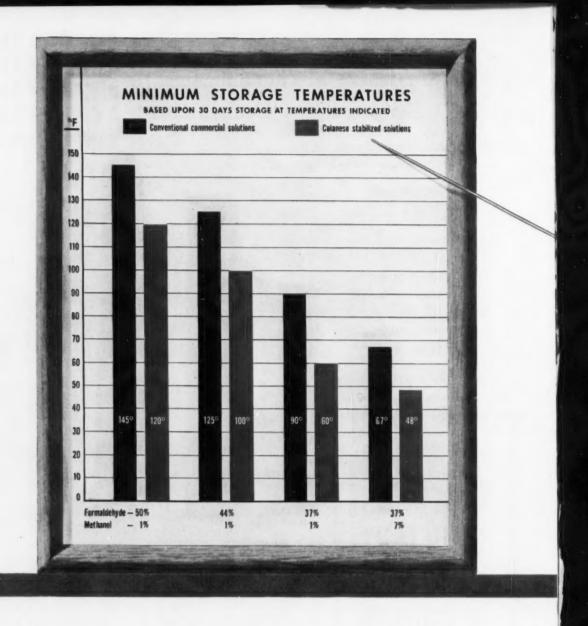
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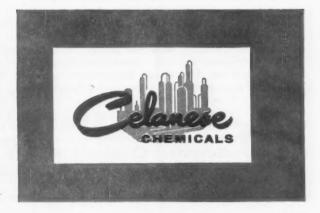


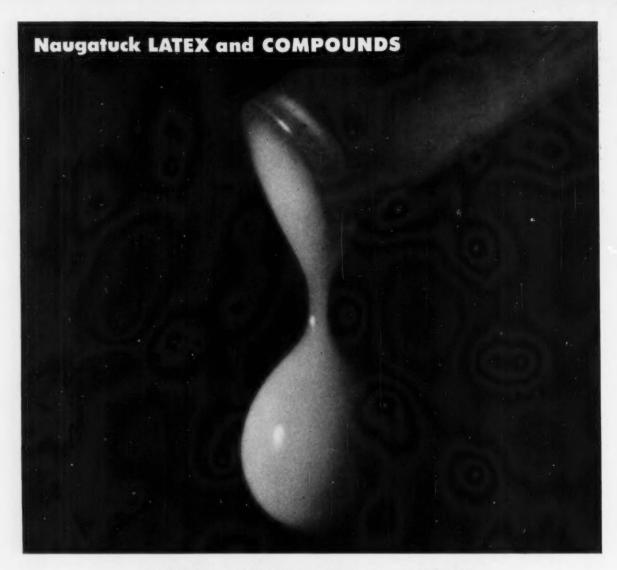
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#### ADMINISTRATION

for those who have the ability and the desire to continue working."

Outlook: During the '60s, say retirement-conscious managers, look for these and other definite patterns of action to emerge as solutions of the problem of an increasingly older work force. Some trends already under way are expected to accelerate: lowering optional retirement ages; raising mandatory retirement ages; better-planned utilization of senior personnel.

#### Legal Clearing House

The complexities of complying with food, drug and cosmetics legislation is pointed up by the recent formation of two advisory groups to help manufacturers assess their obligations under the laws.

Most recent development is within the Food & Drug Administration itself. FDA has set up a trade advisory service on label warnings for drugs and therapeutic devices available without a doctor's prescription. FDA will provide a looseleaf series of sample warnings. In its initial offering, FDA published suggested warnings for more than 140 drugs or drug classes (CW, April 2, p. 24).

In another development, Sonneborn Chemical and Refining Corp. has set up an information center to answer inquiries from users of petroleum products who may be affected by the new food additives amendment. Sonneborn figures that, since most of its own products are in this category, its own staff may be of assistance in explaining the legal and technical aspects of the law. The Sonneborn service will answer questions factually, with no attempt to render opinions.

#### LABOR

Oil Primer: In the first '60 contract to be negotiated by Oil, Chemical & Atomic Workers Union at a major U.S. petrochemical installation, craft employees at the Pasadena, Tex., butadiene plant of Petro-Tex Chemical Corp. got a 12¢/hour, across-the-board wage increase, retroactive to March 6. Also covered by similar terms, but in separate contracts, were carpenters and pipefitters. The three 15-month contracts affect 465 employees, 410 of them represented by OCAW.

The hike brought some craft classifications to an hourly rate of \$3.285, one of the highest such hourly rates on the Texas Gulf Coast. The effect of the rise is expected to reach into negotiations at other major chemical installations, most of which will open contract bargaining by late summer.

Canadian Rubber: Rubber settlements are gaining way in Canada. In one, 1,200 members of Local 113, United Rubber Workers, at the Hamilton, Ont., plant of Firestone Tire and Rubber Co., Ltd., have accepted a one-year contract giving them a package hourly increase of 91/4 \$\psi/\$hour, retroactive to Jan. 26.

And at the New Toronto, Ont., plant of Goodyear Tire and Rubber Co., 1,750 workers have accepted a one-year contract with a 9½ ¢/hour package increase. Seven cents of this is direct wage increase; the remainder, fringe benefit. Other provisions include a 2¢/hour increase in shift differential and an \$8 lump-sum payment in lieu of retroactive pay. The employees, represented by Local 232, United Rubber Workers, also approved a three-year supplementary unemployment benefit agreement extending benefits to 39 weeks from 26.

#### IDEAS

Process Chart: Pennsalt Chemicals Corp. has devised a simplified process chart for distribution among stockholders and other interested persons to show how the company's products are made. To avoid possible confusion over technical terms, Pennsalt shows basic raw materials, intermediates, flow of processing, and resulting products, each identified by easily understood symbols, including trademarks.

Special Day: Johnson's Wax Co. has taken a new tack on providing paid holidays to its employees by setting aside one day—either Monday or Friday—in the spring each year to provide a long weekend. The day, called "Spring Holiday," is set aside as a tribute to "performance and productivity." The company will provide another automatic long weekend in the fall by setting aside the Friday after Thanksgiving as a holiday. The new arrangement brings Johnson's total paid holidays to eight.



#### ADMINISTRATION

#### KEY CHANGES

A. C. Polk to executive vice-president and general manager, Dowell Division (Tulsa, Okla.) of Dow Chemical Co.

Karl R. Bendetsen to president, Dwight Thompson to chairman, board of directors, Champion Paper & Fibre Co. (Cincinnati).

Byron Marquis to president, Frank G. Breyer to chairman, advisory committee, Singmaster & Breyer, Inc., New York City, affiliate of The Fluor Corp., Ltd. (Los Angeles).

Ralph L. Gray to board of directors, Spencer Chemical Co. (Kansas City, Mo.).

Marion M. Smith and William J. Price to board of directors, David F. Cocks to executive vice-president, Warner R. Gaylord to vice-president and Edward G. Sommer to treasurer, Standard Oil Co. (Kentucky), (Louisville).

Monroe J. Blanchard to director and vice-president, manufacturing, Philadelphia Quartz Co. (Philadelphia).

J. Boyd Britton to board of directors and vice-president, development, Godfrey L. Cabot, Inc. (Boston).

George Tooby to board of directors, Susquehanna Corp. (Chicago).

**Herbert A. Lubs** to board of directors, Maumee Chemical Co. (Toledo, O.).

**Philip C. Sayres** to administrative vice-president, Vick Chemical Co. (New York).

Michael Erchak Jr. and Blaine B. Kuist to vice-presidents, research and development and engineering and construction, respectively, Rexall Drug and Chemical Co. (Los Angeles).

**F. O. Boylon** to vice-president, manufacturing, Crown Zellerbach Corp. (San Francisco).

Jack W. Watson to vice-president, Kaiser Aluminum & Chemical Sales, Inc., Ray G. Boyd, Fred J. Drewes and Howard C. Holmes to vice-president, parent corporation, Kaiser Aluminum & Chemical Corp. (Oakland, Calif.).



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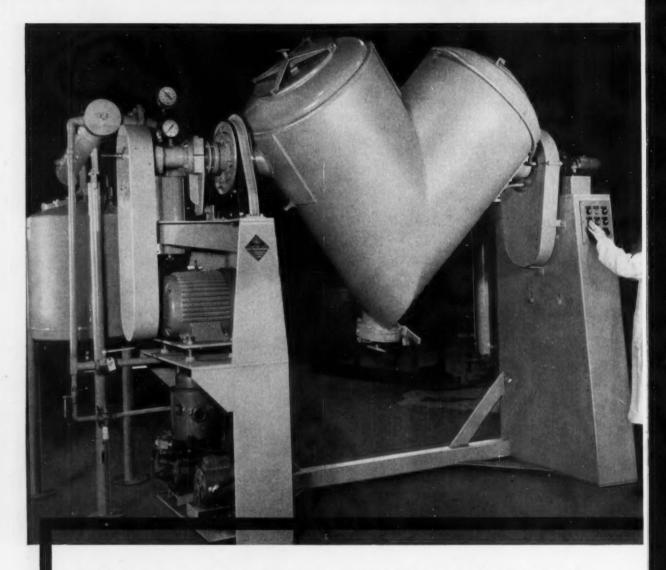
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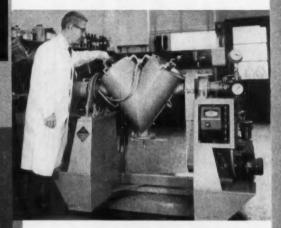
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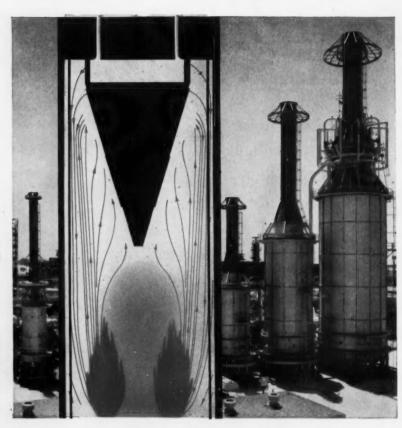
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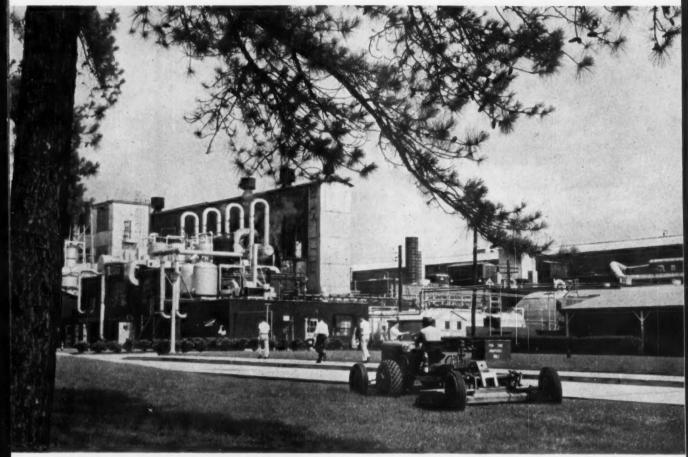
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#### PRODUCTION



Continual grounds-maintenance helps Du Pont's Richmond, Va., plant put its best foot forward.

#### Plant Beautification: Is It Worth the Cost?

Of the \$1.64 billion the chemical industry will spend for new plant construction this year (CW, March 19, p. 23), \$10-20 million will be spent for "beauty." Beautification is a growing trend, despite one question from cost-conscious management: Is the cost of beauty worth results that can't be measured in pounds of products?

Chemical companies that assent point to their plants as the only corporate image most of the public gets. In addition, eye-appealing plants help boost employee morale, encourage good housekeeping practices, and are usually easier to maintain.

But not all companies find the effort worthwhile. One firm that tried the beauty approach for a number of years has quietly given it up after recently deciding that beautification cost too much.

Many firms frankly admit that they have never considered the beauty aspect of their plants. Their contention: it is easy for high-profit industries (e.g., pharmaceuticals) to consider dressing up their plants. But when the profit margin is low and products highly corrosive, the plants' performance, durability and economy are of prime importance, and eyeappeal is left to chance. However, those companies that consciously try to beautify their plants contend that it need not be costly, actually can cut maintenance.

Aesthetics and Austerity: The outdoor-type construction used extensively in the chemical industry improves the odds for an eye-appealing plant, without extra cost. For example, W. W. Kraft, vice-president of Lummus Co., pointed out last week at a University of California seminar that good process design engineering results in the artistic or geometric attractiveness of plant equipment (CW, March 26, p. 112).

Some chemical companies are willing to go one better than good design, paint their plant equipment in bright colors, which call attention to costly leaks and process spills (CW, July 28, '56, p. 28). And particularly in the South and Southwest, where land is less expensive, many plants have enhanced their appearance by setting each process unit in a specific

land block. This leaves surrounding areas clear for easy maintenance and expansion. The effect is a vista, which draws much favorable comment, according to Dow, which is using the technique at its new Plaquemine, La., plant.

But even indoor units don't need costly beauty treatments. For example, Jim Wilson, principal architectural and civil engineer of Du Pont's Design Division, sums up in one word the approach his division follows: austerity. But austerity can be well conceived and eye-pleasing, he adds.

Pleasing appearance may add as much as 2-3% to the plant cost in some cases; but in others, it may even cut cost when some of the newer. less conventional plant building materials and techniques are used. For example, Sinclair's Houston refinery used reinforced concrete rather than traditional steel for a heat-exchanger structure, saved money while gaining eye appeal. Concrete has limitations, however, since it cuts flexibility (alterations in piping and equipment are more difficult). But prestressed concrete, used for a number of years in Europe, is now gaining widespread usage in this country for roofs, etc. Advantage: it can be preformed, must only be set in place rather than poured at the job site.

Curtain walls—made of panels of plastic, coated steel, aluminum, etc., which are hung from beams—are easier to maintain, require fewer expansion joints to prevent cracking than do traditional walls, which also support the roof.

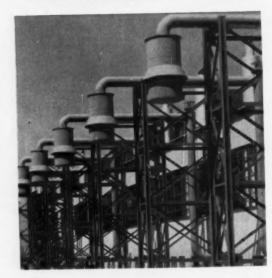
Local Beauty: Some companies point out that the importance of using local building materials shouldn't be overlooked. For example, Buckeye Cellulose's plant expansion at Foley, Fla., last year (CW, May 23, '59, p. 85) extended the use of brick structures, too expensive at some locations, because it is near Georgia's brick-making country. Du Pont used local brick at its new Tecumseh, Kan., cellophane plant, cut cost by switching to colorcoated metal curtain walls above scaffold height.

Firms often use as many of their own products as possible, particularly in plant reception rooms and offices. It's an opportunity to check on product durability as well as to advertise. For example, Du Pont will use metal-

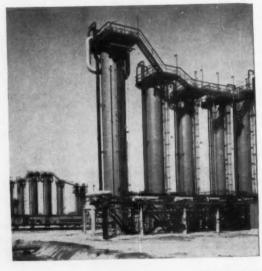
#### Good Process Design Has a Natural Beauty



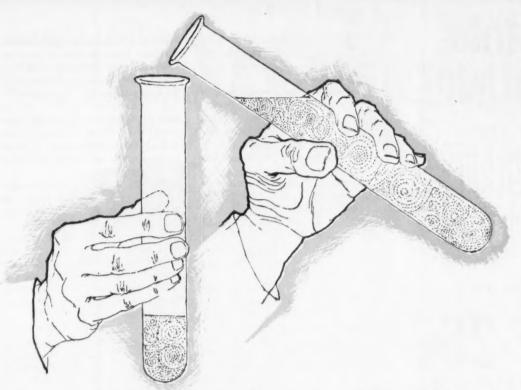
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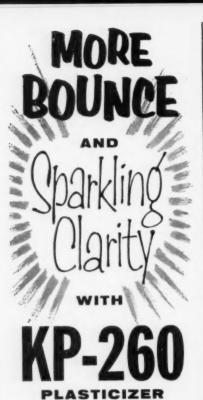


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ized Mylar panels in the lobby of its new Florence, S.C., plant—over the lobby entrance will be a mural made of Mylar film.

Character of Its Own: There is usually no need to force plant beauty. As Du Pont's Wilson puts it: each plant has a "personality" that's dictated by its particular process, and it's a good rule not to try to change this character.

For example, a petrochemical plant should look like a petrochemical plant, a fiber plant like a fiber plant. Acid plants have a character that's set not only by processes but also by the corrosiveness of the product, which limits the construction materials that can be used.

But even plants that are limited by process can put their best foot forward, says Wilson. The least attractive equipment can be kept away from main highways, access roads. For example, several refineries have located picture-windowed control rooms so that users of nearby roads can see colorful control panels. Du Pont's Chambers Works hopes to improve the road approach by locating a new water treatment plant where it, rather than the older plant buildings, will draw the attention of visitors.

Overlooking the River: Mississippi River plants located on sites of old Louisiana plantations have tried to retain the natural, regional beauty. They keep the Spanish-moss-draped live oaks, many 100 years old. Dow's Plaquemine plant retains the original plantation house. American Cyanamid's employees at Fortier gather pecans from the old plantation's trees.

On its Wallingford, Conn., plant grounds, Cyanamid maintains an historical graveyard. Du Pont designed its Parkersburg, W. Va., plant in colonial style, in keeping with local history—the plant site is part of the Washington's Bottoms area granted to George Washington for services rendered to the Crown during the French and Indian War.

Du Pont's Kinston, N.C., plant clings to history of a different sort. Plant Manager W. E. Gladding followed plant design and construction closely, reportedly would not permit construction engineers to remove one particularly handsome oak tree from the grounds. The tree stands today as "Gladding's Oak."

Grounds for Consideration: One

company's engineering vice-president dismisses considerations of plant attractiveness, says that production management won't maintain the beauty in the long run anyway. "The plant manager is enthusiastic at first. But as soon as he sees his production costs rising above those of other plants making the same products, grounds maintenance is one of the first things to go," he contends.

But Lee Wakeman, plant manager at Buckeye's Foley plant, points out that grounds maintenance need not be costly. When the plant needed a groundskeeper, it turned to an interested plant mechanic. After the local forester and county agricultural agent checked the man's knowledge, the mechanic was transferred to part-time yard work, where he is better able to care for the grounds.

"The results of part-time grounds maintenance may be hard to see at first. But results of continual maintenance show up over a long period of time because we never have the big problem of major growth of unsightly grasses and weeds," says Wakeman.

Buckeye has simplified process-area housekeeping by pouring concrete in long strips around outdoor equipment. By using a high water-to-cement ratio and no reinforcing, it saved on initial cost. The 4-in.-thick slabs withstand heat and cold with minimum cracking.

Heavy trucks and vehicles that would crack concrete are kept out of the area by strategically located posts embedded in the ground.

Monsanto's Anniston, Ala., plant, like Buckeye's Foley unit, finds that continuing, year-round attention is no more costly than attention concentrated only in an emergency. And Anniston's drive to spruce up its older plant, win recognition for a top housekeeping job (CW, March 12, p. 102), is an indication that plant management is beginning to put a premium on aesthetics—an item that doesn't show directly on the production record.

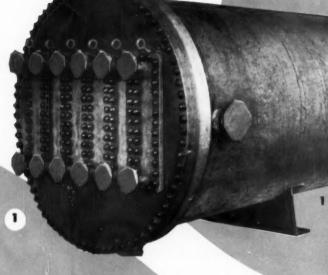
Chances are that as long as it is impossible to put a dollar sign on the value of good-looking plants, their popularity will be the decision of the plant manager. But as more plants are built with an eye toward visual appeal, sound dollar data may be accumulated, and management will someday have a yardstick with which to gauge the value of a "pretty" plant.

Consolidate all your plant "waste heat" sources with this unique

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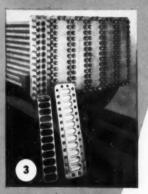
STEAM



This unit has 1700 square feet of heating surface and is designed to generate 13,125 pounds of steam per hour at 150 pounds pressure. Note the six separate and independent circuits of the tube bundle stationary end which is bolted to shell.

- 2 Tube bundle floating end prior to bolting covers to the independent floating tube sheets.
- 3 Floating end of the tub bundle consists of six independent circuits each with its own tube sheet gasket and cover with special integral baffles.





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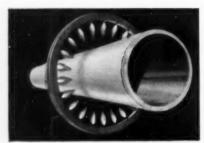


Bulletin HE-8 illustrates many unusual as well as standardized types of heat exchangers. Write for your copy to Dept. 24A-XCW.



April 9, 1960 . Chemical Week

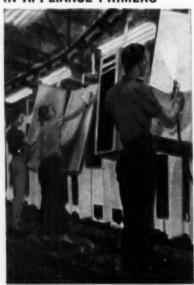
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| Oil contains                                     | Botanical seed source   | Difference from<br>present domestic<br>vegetable oils   | Types of applica-<br>tion envisioned  |
|--|---|---|---|
| Epoxy acids                                      | Numerous members of the sunflower family. Especially rich is an iron weed obtained from India, Vernonia anthelmentica.        | Negligible epoxy acid in domestic oils now used.  | Plasticizers, plastics.   |
| Petroselinic acid                                | Members of the parsley (carrot) family.   | None in present vegetable oils.   | Oxidizable to valuable chemicals for polymers (adipic acid) and surfactants and alkyd resin components (lauric acid). |
| Hydroxy, conjugated<br>dienoic acid              | Also found in selected members of the sunflower family, mainly related to the garden flower, Dimorphotheca, or Cape marigold. | Amount negligible in present do-<br>mestic oils.  | Brand-new fatty acid<br>having high chemical re-<br>activity. Myriad of new<br>chemical derivatives.                  |
| Erucic and related acids with long carbon chains | Members of the mustard family and the meadowfoam, a native annual called Limnanthes.  | Almost all acids of domestic oils have 18 carbon atoms. Rapeseed oil (imported) is principal source of acids with chains longer than C-18. (Rape is in mustard family.) | New dibasic acid for polymers. Lubricants and greases, surfactants, hydrophobic agents.                               |

#### Harvesting Chemicals from Exotic Seeds

Now that it's phasing into applications work, a \$500,000 government research project is drawing increased chemical industry attention. Project: U.S. Dept. of Agriculture's probe of unusual, plant-seed oils, which may be potential raw materials for polymers, detergents, plasticizers, lube additives. Objectives: to return agricultural raw materials to prominence lost to mineral and petroleum products; to provide a raw-material "reserve."

This work, centered at USDA's Northern Utilization Research and Development Division labs (Peoria, Ill.), is aimed now at the cataloging of the oils and their properties. Oils

from familiar (e.g., parsley) and exotic (e.g., Indian iron weed) seeds are being analyzed, their applications investigated, and the routes to most economical production determined.

At the recent 25th conference of the Chemurgic Council in Washington, USDA's Ivan Wolff (Peoria) said agricultural raw materials have often



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#### IRON

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USDA's Wolff and F. R. Earle screen new seed oils in Peoria lab.

lost markets to other materials because too little was known about the plant constituents—a picture he would like to see changed.

Such a change could mean new crops, as well as new markets for the U.S. farmer. Wolff tells Chemical Week that of roughly 300,000 plant species in the world only 200-300 are grown commercially in the U.S. This figure could soar if utilization research pans out.

Seed oil analysis is, of course, only part of USDA's \$16-million utilization program, assigned to only a few of the department's 1,600-man staff. But so far, Wolff's group has looked at nearly 1,800 seed samples, "varying greatly in botanical habit," almost one-third of which have been found to contain 20% or more oil. Only four years old, this study has involved for the most part isolating and identifying the chemical components of seed oils. Very little work has been done on applications.

Application Time: But application information is on the way. At USDA's Western Utilization Research and Development Division (Albany, Calif., work has started on Dimorphotheca (Cape marigold) oil (CW, Dec. 12, '59, p. 58). Leo Goldblatt, head of the field crops laboratory's

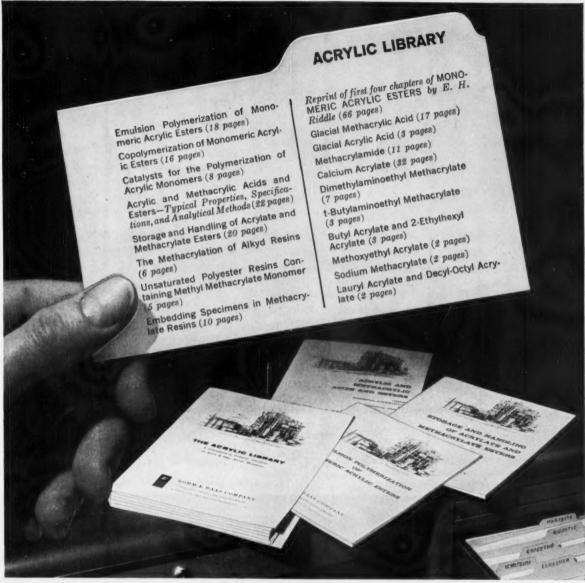
oilseed investigation, says tests confirm the Peoria group's findings that the oil contains about 50% of a conjugated dienoic acid. Goldblatt's plan of action: to probe "the nature and extent of reaction of the oil, its component fatty acids, or their simple derivatives, with reactants selected on the basis of known type reactions and the presence of specific functional groups." This will include etherification, esterification, cyanoethylation, and urethane reactions.

Petroselinic acid oils, from seed of the family *Umbelliferae* (carrots, parsley, parsnips, caraway), are spotlighted in recent applications investigations at the Southern Utilization Research and Development Division (New Orleans, La.). Petroselinic acid is unusual in that it's unsaturated in the 6, 7 position, instead of the 9, 10 position common to most vegetable oils and animal fats. The difference may offer "the opportunity for producing chemical derivatives different from those . . . from other oils."

For example, it can be readily oxidized to adipic acid, used in making nylon. And USDA says the acid oils are being chemically modified for trials "in plastics, synthetic rubbers, protective coatings, and other in-

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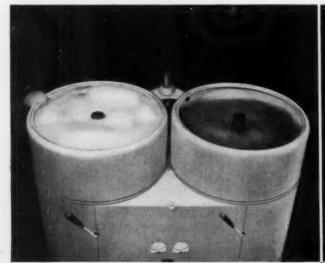
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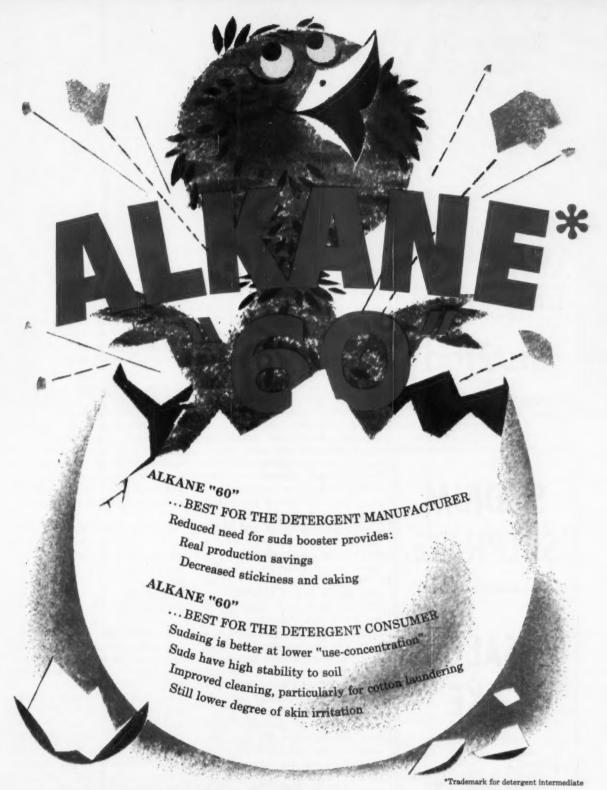
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Alkane "60" heavy duty formulations without suds boosters (left) show improved foaming in soft water compared to dodecylbenzene based products (right).

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#### RESEARCH

dustrial products." First, however, USDA will determine the best natural sources of the petroselinic acid.

Stabilizing Markets: Meanwhile, USDA's Eastern Utilization Research Branch (Philadelphia) has been assigned work on epoxy acid oils, typically derived from an iron weed (Vernonia anthelmentica) native to India. Zeroing in on the 35-millionlbs./year market for epoxy acid stabilizers and secondary plasticizers (with vinyls), Wolff conjectures that "processing steps now required to make epoxy fatty acids could be eliminated if oil were available from natural sources with the desired structures ready-made."

Wolff is spearheading research on several other oils. Seeds of the meadowfoam (Limnanthes), hardy U.S. ornamental plant, yield oil containing high concentrations of C<sub>20</sub> and C<sub>22</sub> straight-chain acids, structures of which "are conducive to use in preparation of other unavailable types of fatty acids (such as the C<sub>15</sub> saturated straight-chain acid), novel gycerides and a variety of chemical intermediates."

Certain mustard seeds yield a C<sub>22</sub> acid, erucic acid, that looks promising for glyceride cleavage reactions. Such oils, Wolff believes, are likely to prove valuable in preparing lubricants, greases, lubricant blends and additives, hydrophobic agents, surface-active agents, waxes, new dibasic acids for polymers, "certain rubberlike materials," resins, plasticizers and special tempering and quenching oils.

Industry's Welcome: The scent of such success in CPI applications is attracting about 1,100 visitors from industry to USDA's Peoria laboratories each year. And so far the program has relatively few industrial critics. Interested companies include leading seed oil producers who concede that USDA's research is of a scope not easily handled by even the largest individual firm.

The occasional dissenter's argument runs something like this: production of fats and oils is increasing faster than uses for them are developing. Why not concentrate research on finding uses for these products (e.g., soybean oil) that are already a glut on the market?

USDA's simple answer: such application work is being done on the well-known seed oils, along with re-

search on exotic oils.

In both cases, the objective is to find markets that can grow with the rising production of fats and oils. So far, while such production has climbed 75% (to 8 million tons/year) over the mark of 20 years ago, demand has moved at a slower pace. The new research not only may develop the needed markets but also may provide a hedge against a possible shortage of the mineral and petroleum raw materials.

#### EXPANSION

- Mallinckrodt Nuclear Corp. is adding 3,200 sq. ft. to its nuclear fuels research facility at Hematite, Mo.
- Allied Research Associates, Inc. (Boston), a newly acquired subsidiary of Boeing Airplane Co., has separated its research and engineering divisions; chemistry and materials work is done in the new research division.

#### PRODUCTS

New Tracers: Nuclear-Chicago Corp. (Des Plaines, Ill.) is offering three new radioactive carbon compounds: cortisone-4-C<sup>14</sup> and its acetate (used in studies of adrenal cortical insufficiency) and 1,2,3,4-dibenzanthracene-9-C<sup>14</sup> (for physiological tracer studies of epithedeal tumors).

Bromine Compounds: Valchem (1407 Broadway, New York 18) is now making these three new brominated compounds at its Langley, S.C., plant: α-bromopropionic acid, α-bromopropionyl chloride and ethyl α-bromopropionate.

Resistant Lube: Pentalube TP-653-B, a synthetic high-temperature lubricant developed by Heyden Newport Chemical Corp. (New York), has received qualification from the Air Force under a newly issued specification (MIL-L-9236-B) for lubes to be used in engines of Mach 3 jet aircraft. The new material, now in production at Garfield, N.J., has undergone 18 months' testing as a fluid for use at 425 F and above.

Polysulfide Binder: Thiokol Chemical Corp. (Trenton, N.J.) has a new solid-propellant binder claimed to combine the advantages of hydrocarbons (high performance) and polysulfides



Test panel on the left, above, was coated with a med. oil phthalic alkyd-based enamel and placed under a Gardner Circular Drying-time Tester with a six-hour cycle. As indicated by the unretouched photograph, hard dry occurred in 5 hours and 50 minutes.

Panel on the right was coated with the same enamel, except that 40% of its alkyd resin was replaced with Neville LX-1000 hydrocarbon resin. The test was conducted under identical conditions of humidity and temperature. Hard dry occurred in 4 hours.

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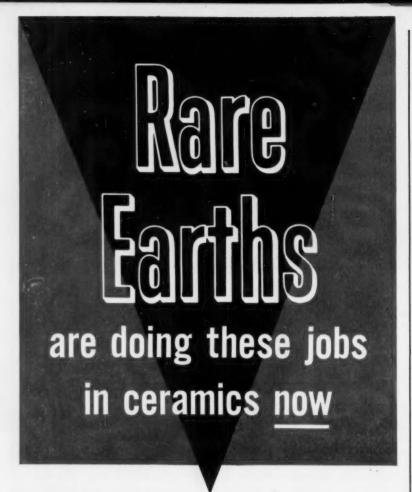
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#### RESEARCH

(processing ease and broad-range performance). Called C-12, the new binder is a polysulfide with a high hydrocarbon percentage. The hydrocarbon content is said to be actually greater than in present hydrocarbon formulations, which require large amounts of other materials to effect a cure.

Epilepsy Fighter: Ciba Pharmaceutical Products, Inc. (Summit, N.J.) has a new prescription drug that reportedly has the ability to relieve epileptic convulsions without causing major undesirable side effects. Called Elipten, the new drug (amino-glutethimide) has been clinically tested for over three years on more than 5,000 patients.

Coating Aid: Biddle Sawyer Corp. (20 Vesey St., New York 7) is now offering 3-methoxypropylamine for use in organic synthesis and in protective coatings.

#### LITERATURE

• Dextran Chemicals, Inc. (509 Fifth Ave., New York 17), has issued a new steroids list. New products push to 270 the number of compounds available.

• Food & Drug Research Laboratories, Inc. (Maurice Ave. at 58th St., Maspeth 78, L.I., N.Y.), offers free copies of the composite food additives "white list" (approved for use by the Food & Drug Administration), first published as part of its house organ, "What's New in Food & Drug Research."

 Dow Chemical Co.'s (Midland, Mich.) Technical Service and Development Dept. has issued the 1960 edition of its research chemicals catalog, including 200 chemicals.

• Over 520 research organics, said to be unavailable elsewhere, are listed in "Addition 1 to Catalog 9" by Aldrich Chemical Co. (2369 North 29th St., Milwaukee 10).

• Listing of an extensive line of labeled biochemicals (including 30 sugars) is a new offering of California Corp. for Biochemical Research (Los Angeles).

• Parr Instrument Co. (Moline, Ill.) has issued a new technical manual on calorimetry called "Oxygen Bomb Calorimetry and Combustion Methods."



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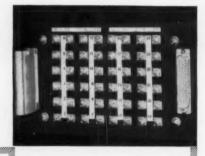
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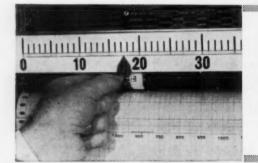
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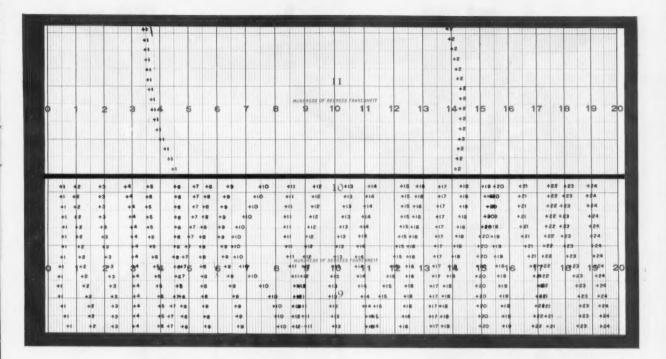




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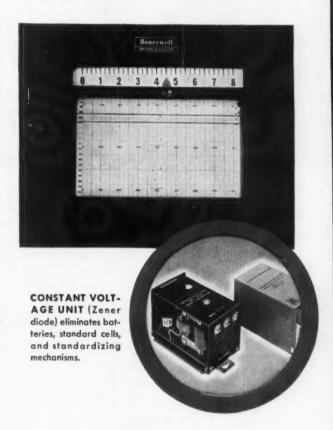
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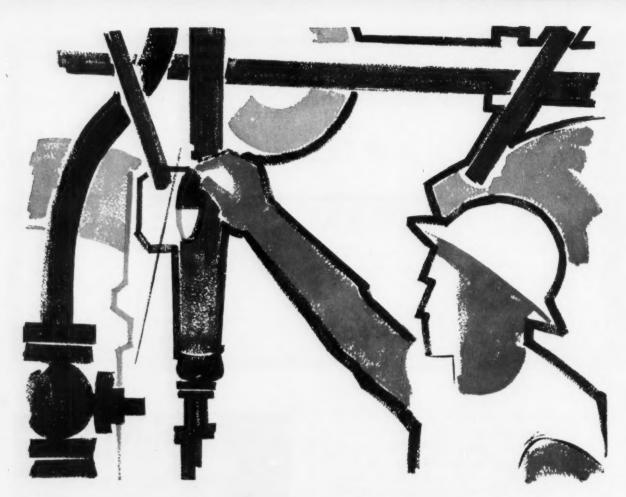


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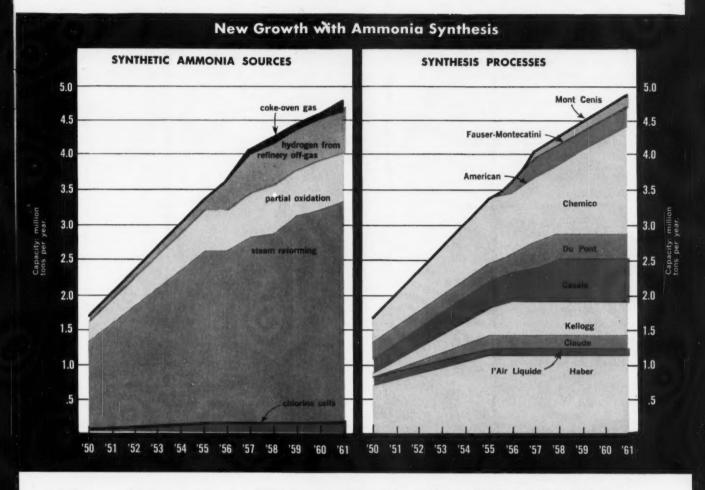


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#### ENGINEERING



#### New Ammonia Plants Take the Middle Road

Trends toward middle-pressure ammonia synthesis processes and growing use of natural gas as source material are reported in a brand-new survey by Stanford Research Institute (Menlo Park, Calif.). Backed up by plant-by-plant data, the report indicates that syntheses in the pressure range of 3,700-5,300 psi. are producing 50% of the total ammonia, while about 75% now comes from natural gas,

Synthetic ammonia may soon be the largest dollar-volume chemical produced in the U.S. Total capacity is approaching 5.2 million tons, production from which is valued at about \$350 million—an estimated \$50 million more than sulfuric acid. Accordingly, ammonia has become a bellwether of our economy as well

as a guide to progress in high-pressure technology.

Synthesis Trends: Ammonia synthesis is a thoroughly explored process. Modern investors pick their process to balance compression costs against equipment sizes, and raw-material costs against plant location. And a current upsurge in capacity is bringing in many new plants that point to the future while reflecting the history of the processes.

Although none of the recently installed plants uses a process called Haber, almost all are modified versions of the original process developed by Haber around 1910. This process made ammonia by mixing three volumes of hydrogen with one of nitrogen and passing them over a catalyst of iron and metallic oxides

at about 3,000 psi. and 1000 F.

With Haber's process, increasing the temperature increases the speed of the reaction, though it cuts down the percent of conversion. On the other hand, increasing the pressure increases the conversion, although it cuts down the speed. Thus, competitive manufacturers tried a gamut of pressure-temperature combinations in an effort to balance the size of the synthesis reactor against the cost of compression and the life of the catalyst.

It soon developed that the optimum temperature was in the range of 900-1100 F, since higher temperatures destroyed the catalyst. But the pressure variations developed into three groups of processes: low-pressure (1,500 psi.), such as Mont Cenis;

medium-pressure (3,700-5,300 psi.), such as Chemico, Kellogg, American and modified Haber; and high-pressure (9,000-15,000 psi.), such as Casale, Claude and Du Pont, Today, the country's total capacity is divided roughly into 22% Haber, 3% lowpressure, 50% medium-pressure, and 25% high-pressure. A glance at the chart (p. 65) shows that about 90% of the recent installations have gone to the medium-pressure group.

The Know-How: In a number of cases, the selection of a synthesis process has probably been overshadowed by the importance of highpressure know-how. Conventional design know-how has long been available in the literature and is included in codes like the API and ASME, which prescribe calculation methods and design procedures up to about 3,000 psi.

Above this pressure, however, chemical processors have had to depend on specialized designers for pipe, valves, instruments, and vessels. For example, Chemico states that in 1929 it couldn't buy high-pressure valves on the market, had to design them itself. (The first valves were crude blocks of steel drilled for ports and stem.)

Then the urgent demand for ammonia during World War II led the government to institute a wider spread of high-pressure know-how. This was carried forward after the war, and today high-pressure equipment such as valves, instruments and piping is supplied off the shelf. Much of the vessel design remains an art, however, since the codes are still limited to 3,000 psi. And designers' calculations must be reviewed by an insurance company or state authorities before a plant is put into operation.

For this reason the ammonia converters are among the few proprietary items covered by licensed synthesis processes. These huge vesels (typical units run about 4 ft. in diameter by 50 ft. long) require ingenious designs. Connections are gathered and limited, since they are sources of leaks; and the internals comprise complicated arrangements of baffles, baskets and heat-exchangers to assure constant catalyst temperature and removal of the exothermal heat of reaction, Converter design is one of the most important differences between competitive synthesis processes.

Synthesis Gas: The raw-materials picture has changed radically since Bosch first worked with Haber to produce a hydrogen-nitrogen mixture by passing steam and air over incandescent coke. Hydrocarbon fuels, such as natural gas and fuel gas or oil, have grown steadily, until they currently make up about 85% of the

Another popular source has been off-gas from reforming naphtha over a platinum catalyst. This gas, which contains over 75% hydrogen, has added a novel twist to ammonia processing. It is cleaned by washing out hydrocarbon impurities with liquid nitrogen, then is mixed with nitrogen to make synthesis gas. Although the best source of this nitrogen is a tonnage-oxygen plant, there is no use for the oxygen produced. Result: ammonia manufacturers might work out over-the-fence procedures. They can send off-gas to outside tonnageoxygen producers who return clean hydrogen-nitrogen synthesis gas, and market the impurities recovered, as well as their oxygen.

These raw materials are the biggest economic feature of modern plants, since the processing units making synthesis gas account for about 75% of the total investment. There are a host of processing routes available and it is impossible to tie actual figures to a source. Experts agree, however, that: (1) the investment and operating costs go up as the molecular weight of the hydrocarbon feed goes up; and (2) costs of making ammonia from fuel oil are about 10% higher than from natural gas.

A rundown of the process steps as they are currently used points up some of the advantages and disadvantages of available raw materials:

· Steam reforming: This is the most popular process, producing about 65% of the total synthesis gas in '60. It converts natural gas or fuel gas lighter than butane into hydrogen, nitrogen, carbon dioxide and carbon monoxide. Air, gas and steam are mixed and passed through a reforming furnace at 1800 F and a catalytic reformer at 700 F. The carbon monoxide and carbon dioxide must be removed in following steps, for they poison the ammonia catalyst.

· Partial oxidation: This competes

with steam reforming and is the second most popular manufacturing process, turned out about 15% of total synthesis gas in '60. It converts fuel gas or oil into hydrogen, nitrogen, carbon dioxide and carbon monoxide. The oil or gas is mixed with steam, heated to about 2700 F, and partially burned with a controlled amount of oxygen-enriched air. The carbon dioxide and carbon monoxide must be removed. The process requires a tonnage-oxygen unit for its oxygen requirements, and nitrogen from the tonnage-oxygen unit is used to remove carbon monoxide.

· Shift reaction: Both steam reforming and partial oxidation are followed by this step, which converts most of the carbon monoxide into carbon dioxide and hydrogen. The gases are mixed with steam and passed over an iron oxide catalyst at about 800 F.

· MEA unit: Both steam reforming and partial oxidation use this step to remove carbon dioxide after the shift reaction. The gases are passed through a 20% solution of monoethanolamine (MEA) at near-ambient temperatures and pressures. The MEA is continuously regenerated.

· CO removal: After carbon dioxide is removed, the gases are compressed and the carbon monoxide removed. This is handled in either of two ways: (1) a cuprous ammonia acetate wash, or (2) a nitrogen wash when nitrogen is available from a tonnage-oxygen unit.

Although refiners are finding more profitable uses for by-product hydrogen, refinery off-gas remains a popular source of synthesis gas. Breakpoint for processing this gas is a hydrogen content of about 75%. With this much hydrogen, the gas can be sent directly to nitrogen wash. With less hydrogen, it's normally more economical to decompose the hydrocarbons by steam reforming.

The charts (p. 65) show only installed capacity, are some 10% below the results obtained from SRI's plantby-plant statistics. However, they reflect the same growth trend-an increase of about 150,000 tons/year. This points to synthetic ammonia's continually expanding markets. And it underscores the vital role allotted to synthesis techniques, high-pressure know-how, and raw-materials processing in the years ahead.

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#### ENGINEERING

#### PROCESSES

Uranium for Processing: Potential chemical uses for depleted uranium -the nonradioactive isotope remaining after fissionable U-235 has been removed-could lead to sizable markets for this nonfissionable by-product of AEC's gaseous diffusion plants. According to reports by Battelle Memorial Institute and by Oak Ridge National Laboratory, CPI uses now being investigated include: uranium compounds for catalysis; inorganic ion-exchange systems; radiation shielding; uranium refractories; cathodic protection devices. Because the depleted uranium is in the form of hexafluoride, its conversion into oxides or other compounds would permit recovery of concentrated hydrogen fluoride. Battelle's report suggests that the required process research and development and industrial-scale trials will take some time, but a few new markets may develop within the next five years.

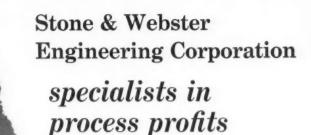
Deep-Well Disposal: Anaconda Uranium (Grants, N. M.) recently started up an injection well for the disposal of radioactive wastes. Up to 400 gal./minute of contaminated process material can be injected into underground formations at a depth of 1,780 ft. Although this is the first such installation for radioactive wastes, injection wells for chemical wastes have been used for some time. Du Pont operates an injection well at its Victoria, Tex., works; Shell Chemical uses a subsurface disposal well exclusively for waste-handling at it new Deer Park, Tex., phenol plant, has a similar disposal system at Norco, La.

Ceramic Disposal: Coors Porcelain Co. (Golden, Colo.) will step up its development of ceramic "sponges" for radioactive waste disposal. Coors has been working on the technique for about two years (CW, Nov. 29, '58, p. 56), is now concentrating on the development of a highly absorbent ceramic. Basically, the disposal process consists of alternately soaking and drying porous clay bricks until they become loaded with the radioactive residues (in early tests, bricks absorbed up to double their original weight in four soaking-drying cycles). The bricks are then vitrified by firing at high temperatures (1300 C) to lock in the dangerous waste products. Coors reports that leaching tests indicate ceramic sponges "may provide a safe method of disposing of liquid wastes." The project is being carried out in cooperation with the University of California's Los Alamos Scientific Laboratory.

Slag Recovery: A giant slag dump at Port Pirie (in southern Australia) is slated to be reworked for the recovery of its zinc content. Broken Hill Associated Smelters, which claims to be the world's largest producer of refined lead, plans to invest close to \$7.5 million in the recovery plant. Slag will be reprocessed in a new type of blast furnace; the zinc is expected to be sold on world markets around the end of '63.

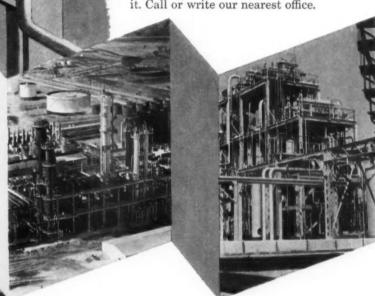
New Route to Nylon-6: Badische Anilin- & Soda-fabrik is reported studying a process developed by Holzverzuckerungs AG. (Domat/Ems, Switzerland) for producing cyclohexanonoxime, a nylon-6 intermediate. The process oxidizes cyclohexylamine with hydrogen peroxide in a 25% aqueous solution with 10% methanol and sodium tungstate catalyst. Hydrogen peroxide (35%) stabilized with 0.5% magnesium sulfate is added in a 1.2 molal ratio. Recycled cyclohexylamine, catalyst, and the product are separated by centrifuging and vacuum distillation. Yields are 91%, based on the hydrogen peroxide.

Nitric Pulping: Napex, Inc. (Grand Junction, Colo.), intends to use a nitric acid process for pulping wood and plant fibers in a new pulp mill it's planning to build in Colorado. Commercial feasibility hinges on the recovery and re-use of nitric acid. For this critical operation, Napex has obtained rights to a nitric recovery method developed by French scientist Jean Desforges. Another French processdubbed Delbay-for nitric acid pulping was tried in a 20-tons/day plant in northern France. It is said to simplify equipment requirements, reduce chemical consumption, cause less degradation of alpha-cellulose (CW, Jan. 22, '55, p. 34). But U.S. pulping experts question the feasibility of re-using the nitric acid without loss in yield or darkening of the pulp.



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- If you have need for urethane foam to be applied in your plant, get in touch with a prepolymer maker or foam applicator.
- **3.** If you make, or wish to make, urethane foams as a part of your own products or processing, write us direct, describing your requirements in as much detail as possible. Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.

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#### Technology

#### Newsletter

CHEMICAL WEEK April 9, 1960 Mixed cis and trans iso-oleic acids for soaps can be made by a new process developed by Stanford Research Institute for Tallow Research, Inc. (San Francisco). SRI starts with natural monoethanoid unsaturated fatty acids (C<sub>n</sub> H<sub>2n-2</sub>O<sub>2</sub>), uses an undisclosed low-cost, reusable, nontoxic catalyst to achieve the conversion. Soaps made with the iso-oleic mixture are free-flowing crystalline powders, said to have two to three times the detergency of conventional cis oleic acid soap.

Boron-phosphorus polymer protective films are under study at Du Pont's Experimental Station. Some process and performance details emerged at last week's symposium on organometalloid polymers held at Armstrong Cork Co.'s Research and Development Center (Lancaster, Pa.). Monoalkyl (aryl) phosphines condense, then form polymers by elimination of hydrogen. These are soluble (e.g., in dimethylsulfoxide, or dimethylformamide), form films that don't discolor. Thin films on copper protected the metal against discoloration from the atmosphere for two years, according to S. Yolles, of Du Pont's Research Division Fabrics and Finishes Dept.

A new supplier of dimethylsulfoxide—Carad Chemical Co. (Palo Alto, Calif.)—is eyeing a potential boom in DMSO requirements for new manufacturing techniques being considered by major synthetic fiber manufacturers. Carad this week disclosed that it has been making DMSO by a nitric acid oxidation process since last November. It is now running at a 1-million-lbs./year clip. Crown Zellerbach, which is currently the only other DMSO producer in the U.S., is supplying Carad with dimethylsulfide starting material and taking the plant's total output.

Carad's entry into DMSO production filled a market gap created by Stepan Chemical Co.'s withdrawal, following an explosion that destroyed its DMSO plant in June '59. CZ exports large quantities of DMSO to Japan's Toyo Rayon Co. (for use in Toyo's new polyacrylonitrile-cellulose acetate fiber process), reportedly gave Carad a technical assist with its oxidation process.

CZ is readying a 5-million-lbs./year plant to start producing DMSO at Bogalusa, La., this fall. For this operation, CZ obtained exclusive U.S. and Canadian rights to a Swedish process owned by Nitroglycerin Aktieblaget (Gyttorp). It's believed to be a liquid-phase oxidation of DMS, using a nitrogen oxide catalyst. CZ predicts it will be more efficient than existing processes.

New methods of producing nitrogen-fluorine propellant compounds have been developed by Thiokol's Reaction Motors Division (Denville, N.J.). One method is said to improve the yield in the production of

#### **Technology**

Newsletter

(Continued)

nitrogen trifluoride; the other is a new procedure for preparation of dinitrogen tetrafluoride, dinitrogen difluoride and difluoramine. Thiokol researcher Scott Morrow will cover the developments in an unclassified discussion of the fluorination of ammonia at next week's Cleveland ACS meeting.

A new polynosic fiber (modified cell'ulosic fiber) (Z54) by Societe de la Viscose Suisse (Emmenbrucke, Switzerland) features high tenacity, good dye affinity, dimensional stability. Like Zantrel, first of the polynosics (CW Technology Newsletter, Aug. 22, '59) it's designed for a wide range of textile uses.

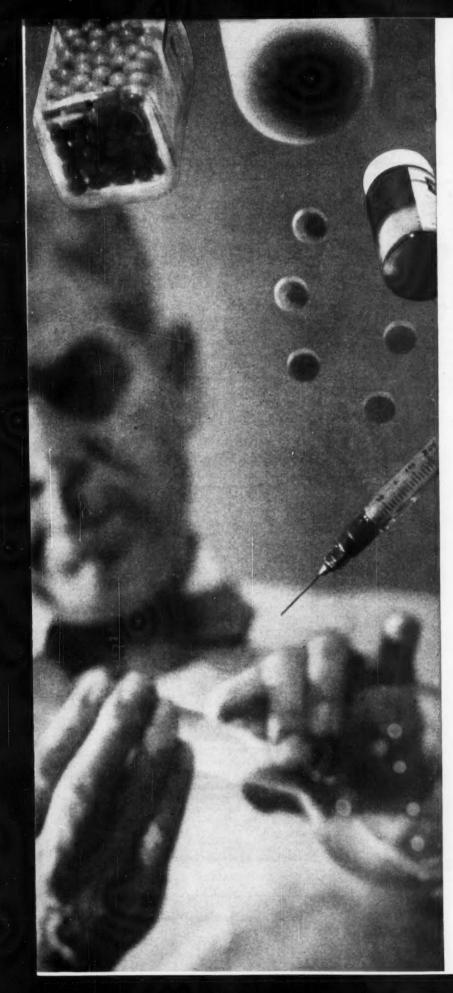
Fuel cells will supply operating power for a new fork-lift truck soon to be tested by Allis Chalmers. At last week's American Power Conference in Chicago, AC research supervisor T. Kirkland disclosed that the new truck will use a different combination of fuel gases than the oxygen-propane fuel employed in the company's fuel cell-powered tractor (CW Technology Newsletter, Oct. 24, '59, p. 72). Power capacity of the experimental fork truck will likely be under 10 kw.

Fuel cells in the tractor power unit have now run more than 500 hours at temperatures from 0 to 85 F. AC is working on material and production costs, admits that fuel cell power is still short of commercialization.

A new spray calcining technique for concentrating large volumes of radioactive liquid wastes into smaller volumes of powder or clinker-like solids was detailed at this week's Nuclear Congress in New York. General Electric's B. M. Johnson reported that research now under way at the Hanford AEC plant (near Richland, Wash.) indicates the new calcining method can be scaled up to handle Hanford's output of high-level wastes. It's expected to be cheaper, more effective than other disposal techniques.

The current tests involve spraying a simulated waste solution or slurry into the top of a 10-ft.-long section of 8-in.-diameter tube. The entire column is heated to 1600 F by passing low-voltage current through it. Sprayed droplets of waste are dried to a powder before reaching the bottom of the calciner, may be further concentrated by reheating to form clinker-like solids. An important advantage of spray calcining is its ability to handle many different types of waste solutions.

Price reductions of up to 30% in Teflon-lined pipe and fittings indicate that Resistoflex Corp. (Roseland, N.J.) is making good its aim to compete with stainless steel piping on an installed-cost basis (CW, Feb. 27, p. 101). Lower resin cost and improved manufacturing techniques are given as reasons for the firm's price cuts from \$10.80/ft. to \$7.50/ft. for 100-ft lengths of 2-in. pipe with flanges, and from \$17.95/ft. to \$12.60/ft. for 3-in. pipe. Goal still to be reached: Teflon pumps and valves to complete the all-Teflon piping system.



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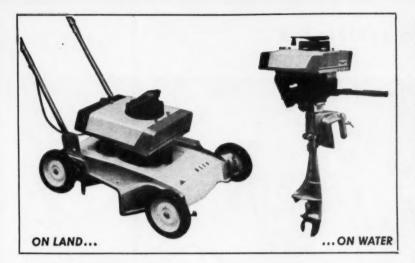
#### A TRIPLE PLAY BY PRO-FAX

This Triple Duty Filter Dispenser, an exclusive feature found in all Philco-Bendix "Automagic" washers, is another example of the advanced engineering made possible by the proper use of such new plastics as Pro-fax polypropylene. Exploded view (left) shows the six injection-molded parts which make up the assembly of this compact, highly functional unit. Removable cap and cup shown at top are polyethylene. The remainder of the unit consists of four precision-molded Pro-fax parts which are ingeniously joined to form the body of the dispenser filter. The dispenser lid is permanently joined to the upper half of the body by spinwelding, while the lower half is attached by self-tapping screws. The removable filter trap (at bottom) has a molded bayonet-type catch, with an insert-molded metal mesh filter. Pro-fax was selected for this demanding assignment because of its outstanding resistance to detergents and chemicals, and its ability to withstand prolonged exposures to high temperatures. Lightweight; a handsome, colorful finish; and resistance to breakage are other features of the new unit. And of course the producer enjoyed all the important processing bonuses provided by Pro-fax, including more parts per pound, and dimensionally stable, precision fitting components.

Instantly accessible when the washer is open, Philco's Triple

Duty Dispenser serves three important functions in the washing cycle. The entire tub of water is filtered six times a minute to remove all traces of lint. It provides automatic detergent dispensing at any preselected water level, insuring even dispersion; and it automatically dispenses clothes conditioner at the proper time to assure a softer, cleaner wash.

Molded by Seneca Plastics Company, Cambridge, Ohio.



#### DOUBLE PLAY BY ACCO

The new Acco "Outboard Mower" is not only an industry first, but one of the first big new merchandising ideas of many a year. It's a power mower with a motor that can be removed and attached to a propeller unit to make a powerful outboard motor. The conversion can be effected in minutes, and on land or water the motor is protected at all times by a

colorful, durable housing molded with Pro-fax. Pro-fax proved the only plastic with all the requirements demanded by this new concept in dual-purpose equipment: lightweight, rigidity, resistance to heat, chemicals and staining, plus a lustrous surface finish that bespeaks quality merchandise.

Molded by Research Plastics, Inc., Jersey Shore, Penna.

#### A HIT BY REGINA

This attractive, low-cost plastic accessory is certain to be a hit with homemakers who own a Regina Polisher-Scrubber. Waxing is no longer a chore with this new automatic dispenser unit. Fingertip control assures uniform distribution of wax, avoiding waste and yielding professional results without splashing or stooping. For the ultimate in appearance and performance in this new appliance accessory, Regina selected Pro-fax. In addition to providing lightweight strength in a handsomely styled unit with a colorful, stain-proof finish, Pro-fax supplies the excellent sealing qualities needed for a leak-proof seal, plus resistance to wax solvents such as turpentine.

The new Pro-fax pump unit is easily attached to the Regina Polisher-Scrubber handle. When not in use, it will not hamper normal operation.

Pump unit molded by Ideal Plastics Division, Ideal Toy Corporation, Long Island, New York.



#### HERCULES POWDER COMPANY

900 Market Street, Wilmington 99, Delaware

THREE NEW MATERIALS FOR THE PLASTIC INDUSTRY

HI-FAX® HIGH-DENSITY POLYETHYLENE . PRO-FAX® POLYPROPYLENE

#### Design Hi-lites

The dramatic change-over by producers of light-duty liquid detergents to blow-molded plastic bottles has focused new attention on a long-established processing technique. Blowmolding is one of the oldest of plastic arts, and designers have long been intrigued by the intricate shapes and unusual forms which can be achieved by this method. Until recently, however, materials adaptable to blowmolding lacked the structural and functional characteristics required to yield rigid structures suited to a wide range of uses. The advent of such new plastic materials as Hi-fax, highdensity polyethylene, has changed this picture to the point where blowmolding has now become the fastest growing sector of our industry.

Permitting the use of undercuts, blow-molding can achieve intricate shapes impossible by other methods. Modern version of classic vase in design below could serve as watering can, condiment bottle, or medicinal container. Sketches by Sundberg-Ferar.





Blow-molded Hi-fax containers can be designed with a "bellows" action in packages that serve as pumps or dispensers. Design shown above is for a household deodorant or insect spray container.

The sketches shown here are but two of the many exciting and different product ideas shown in a new Hercules film-strip, "Something New in Packaging." If you'd like to see this up-to-date report on a new industry and the materials which serve it, write or call us. It will take only minutes of your time, may put your new products years ahead.



PENTON® CHLORINATED POLYETHER



#### CPI Shippers Call for Half-Speed Approach

By the end of next week, the controversial St. Lawrence Seaway will be entirely open—ice and weather permitting—for the '60 shipping season. It's the second year of deep-draft (27 ft.) operation. For most concerned, this year's outlook is rosy—with prospects for a 45% spurt in total cargo tonnage. But the chemical process industries aren't so optimistic; some CPI traffic managers even predict fewer chemicals will take to the Seaway in '60 than in '59 (table right).

This cautious, even negative, attitude on the part of many CPI traffic men is not new. Despite the overflowing enthusiasm of Seaway proponents, most CPI management men have held steadfastly to the belief that the improved Seaway will not be a boon to the CPI in the immediate future, will require five or 10 years' development. Reason: serious operational problems in Great Lakes ports and on the Seaway itself.

Moreover, traffic men believe it will take several seasons' experience to allow seesawing rates to stabilize. For example, rate reductions by Canadian railroads last year won back some chemical traffic that had been moving through the Seaway. This type of competitive rate adjustment likely will continue, say CPI traffic men.

This is not to say most CPI managers see a bleak future for the Seaway. On the contrary, most of them agree that when the Seaway matures somewhat, it will provide a mighty impetus to CPI development in the northeastern United States and Canada, through lower transportation costs (both land and water), morerapid industrial growth.

Disappointing Kickoff: Many CPI shippers' doubts about the Seaway were partially confirmed by last year's over-all shipping performance. The new waterway has a serious handicap in that it is open only eight months of the year (mid-April to late November). And some traffic men complain that its 27-ft. draft is too shallow for most ocean-going tankers. Moreover, the Great Lakes region has the natural disadvantage of being considerably farther from South American and Far Eastern ports than U.S. East Coast cities.

To add to these inherent difficulties, the Seaway's opening came last year in the midst of a worldwide oceanshipping slump, later encountered the longest steel strike in U.S. history, which severely crimped iron-ore traffic. Then, too, delays in dredging held up the effective start of the '59 shipping season until late June.

Woefully inadequate dock facilities and inexperienced dock and canal workers also hampered Seaway shipping, as did lack of joint or through rates—rates that account for all legs of an overseas shipment in one bill of lading.

Ocean carriers—particularly American flag lines—had a difficult time turning a profit in '59 on the Seaway. Reasons: too many ports of call, lack of cargoes, severe rate cutting.

Result in '59 was that traffic, including CPI traffic, was 5 million tons—20%—less than the expected 25 million tons. Considerable tonnages of chemical products were moved, but a very large part of this was simply U.S.-to-Canada interlakes traffic.

CPI traffic through the Montreal-Lake Ontario section (Seaway project area) in thousand tons: coke and coal, 1,214; paper and wood products, 664; petroleum products, 548; salt, 104; sulfur, 90; phosphate rock, 66; industrial chemicals, 50; ores and concentrates (excluding iron ore), 29; sodium products, 14.

#### Seaway Traffic Through Two Key Zones

(thousand tons)

|                              | Seawa     | Project      | Well      | and Canal    |
|------------------------------|-----------|--------------|-----------|--------------|
|                              | All Cargo | CPI Products | All Cargo | CPI Products |
| Total cargo                  | 20,355    | 3,975        | 27,160    | 9,110        |
| Upstream                     | 10,870    | 2,945        | 9,540     | 2,780        |
| Downstream                   | 9,485     | 1,030        | 17,620    | 6,330        |
| U.S. exports                 | 4,500     | 905          | 11,230    | 5,207        |
| To Canada                    | 1,800     | 880          | 8,480     | 5,180        |
| To other foreign countries   | 2,760     | 25           | 2,750     | 27           |
| U.S. imports                 | 6,815     | 805          | 7,940     | 1,650        |
| From Canada                  | 5,760     | 625          | 6,940     | 1,510        |
| From other foreign countries | 1,055     | 180          | 1,000     | 140          |
| U.Soriginated traffic        | 4,600     | 930          | 12,215    | 5,870        |
| Canadian-originated traffic  | 13,860    | 2,475        | 13,900    | 3,080        |
| Foreign-originated traffic   | 1,895     | 570          | 1,045     | 160          |

Source: Traffic Report of the St. Lawrence Seaway

#### to St. Lawrence Seaway Use

Welland Canal traffic (thousand tons): coke and coal, 4,875; paper and wood products, 892; petroleum products, 604; cement, 222; ores and concentrates, 296; industrial chemicals, 127; sodium products, 109.

Overseas Overrated? The fact that much of the chemicals moved on the Seaway were between the two North American countries highlights a point casual observers have overlooked. They tend to regard the Seaway as a route for European-U.S. (or Canadian) shipments—rather than a virtual "domestic" water route. A look at the Welland Canal traffic makes it "domesticity" clear—that segment of the Seaway handled 27 million tons of cargo; only 20 million tons went the full Seaway distance.

Key U.S.-to-Canada items: phosphate rock, lube oils and grease, industrial chemicals, coke, ores and concentrates, sulfur, tar products, sodium products. These products greatly outvalued the materials sent to the U.S. from Canada.

Europe's Opportunity: Overseas nations, however, regarded the Seaway as a new opportunity to send chemical products to the U.S., and sent us more than seven times the tonnage we sent to foreign ports.

Principal commodities shipped to the U.S. were pulpwood and woodpulp, ores, industrial chemicals, crude oil, fuel oil, petroleum products and sulfur. U.S. commodities moving abroad via the Seaway include: coke, soybean oil, industrial chemicals, petroleum products.

CHEMICAL WEEK has talked to few chemical shippers who are enthusiastic about the nation's "fourth coast." One exception: Dow Chemical Co., which has been a Seaway shipper for several years (via the old St. Lawrence Canal before the improved Seaway opened). It had used it for raw materials and packaged chemicals alike. Dow has had a hand in developing terminal and dock facilities and figures the Seaway offers it genuine shipping advantages.

Generally, though, chemical shippers are not convinced they can benefit significantly by its use. Both Wyandotte Chemical Corp. and Parke, Davis, for example, used the Seaway last year for small shipments, and both noted that delays in transit hurt their delivery schedules.

What's Ahead: Monsanto Chemical Co. shipped some products via the Seaway last year, foresees a slight rise in '60. International Minerals & Chemical Corp. also has made nominal use of the Seaway and figures to ship large volumes of potash from its Esterhazy, Saskatchewan, operations sometime next year.

On the other hand, Du Pont, Union Carbide Corp., Olin Mathieson, American Cyanamid and Stauffer say the Seaway offers them very little, at least right now. Result: they ship almost nothing via the Seaway.

Even some companies, such as Du Pont of Canada, that had shipped regularly via the Seaway, have reverted to rail shipments. But Du Pont pointed out that it was the presence of low Seaway rates that brought about more reasonable rail rates on its cyclohexane shipments. Electric Reduction Co. of Canada Ltd. had the same experience in shipping phosphate rock.

Despite the CPI's lukewarm attitude, Seaway officials predict '60 tonnage will jump to 29 million tons, 33 million by '61, 37 million tons by '62, some 50 million tons of cargo by '68.

Moreover, Seaway officials tell CHEMICAL WEEK that tolls absolutely will not be raised in '60, probably won't be touched until '64, when review is called for by legislation.

Lake ports are rushing their dock modernization and channel deepening activities to get their share of added Seaway business. Chicago recently launched into a concerted program to spur its export business, tabbed it "Operation Export." And just recently, E. B. Griffith, general manager of Toronto Harbour Commissioners, predicted that port cities on the Great Lakes soon will band together to form an International Great Lakes Port Assn. Purpose: to help plan and execute mutual action by lake ports on common problems. Look for action on this during mid-June.

Ocean shipping lines are preparing for the '60 shipping season, too. On their agenda: reduction in number of ports of call, possible rate hikes.

The optimistic estimates of a near-50% jump in total Seaway cargo tonnage, however, is not expected to include CPI materials. Most CPI management men are convinced the Seaway will provide significant benefits for their industry; but it will take several years to realize it.



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#### Fertilizer Outlook

Although fertilizer sales during 1959-60 will likely top those of the previous season, fertilizer makers are cautious about the future, foresee plenty of knotty problems ahead. This is the consensus of 12 representatives of the fertilizer industry, who gathered recently in Skokie, Ill., for International Minerals & Chemical Corp.'s third customer advisory panel.

Beyond the '59-'60 season, panel members noted, the outlook is hard to predict. This is because one important factor—number of acres harvested—will be determined by political decisions.

Other Problems Ahead: In addition, industry leaders know they'll have to grapple with a number of other tough problems. Chief among them: collection problems, overloaded inventories and a poor public image in certain areas resulting from charges that fertilizers and pesticides are poisoning the ground and crops.

There was general agreement on the panel that farmers currently are not paying their bills as promptly as in the past. So far, though, the panel agreed, this has not proved a serious problem. J. D. Stewart, Jr., president of Federal Chemical Co. (Louisville, Ky.), told the group that most fertilizer companies now refer delinquent accounts to the banks, which take over the account and reimburse the firms immediately.

Overloaded inventories are a serious problem at present. Because of poor weather conditions all over the country, fertilizer isn't moving. Panel members could not agree whether sales promotion would help the situation.

Stewart declared that no amount of promotion would help move fertilizer now. But Ark-Mo Plant Food Co. President L. G. Black told the panel that his firm had successfully used radio advertising to get farmers to stock up on fertilizer. His pitch: buy now to be ready for the arrival of good weather.

The panel agreed the late selling season is not likely to affect prices, since most commitments were made during the winter months.

On the subject of ground and crop poisoning, panel members believe research has proved that fertilizers and pesticides cause no harm. In looking at ways to combat the adverse publicity aimed at agricultural chemicals, IMC said it feels its policy of continual product improvement is satisfactory; therefore it doesn't run special educational campaigns.

True Barometer Needed: IMC
President T. M. Ware told the panel
that "in projecting fertilizer sales,
the true barometer is the money
available for production costs. For
example, total net farm income in
'59 was \$11.8 billion, but farmers
put out \$26 billion for production
costs, expect to spend \$26.4 billion
in '60."

Ware suggested that farm cash receipts, which have risen from \$9.1 billion to \$33 billion in 20 years, are the best indicator of farm purchasing power, since that figure includes money available to meet production costs. Fertilizer sales reportedly average 4.5% of farm cash receipts.

Ware cited two major factors as being responsible for the record sales of plant nutrients in '58-'59: more acreage harvested, and a \$4-billion increase in farm cash receipts during the '57-'58 crop year. Result: the fertilizer industry enjoyed a \$180-million boost in sales.

#### DATA DIGEST

- Research Chemicals: New, 40page catalog lists company's line of more than 200 chemicals now available in sample quantities. Data provided: names, formulas and typical properties. Technical Service and Development Dept., Dow Chemical Co. (Midland, Mich.).
- Agricultural Clays: Folder lists property and use data for line of absorbent clay-based materials used in agricultural dusts and wettable powders. Minerals and Chemicals Corp. of America (Essex Turnpike, Menlo Park, N.J.).
- Tributyl Aconitate: Data sheet provides basic data on tributyl aconitate, a plasticizer-stabilizer used in vinylidene chloride polymers. Chas. Pfizer & Co. (Brooklyn 6).
- Industrial Chemicals: New 12-page price list covers company's line of fine and industrial chemicals. Prices are listed on a per-pound basis, along with information on containers. J. T. Baker Chemical Co. (Phillipsburg, N.J.).

## **SERVICES**

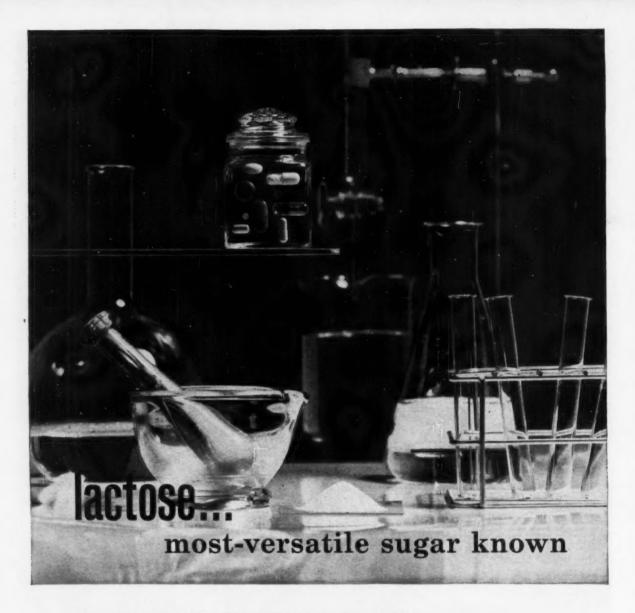
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#### Market

#### Newsletter

CHEMICAL WEEK April 9, 1960 The U.S. will sell 470,000 long tons of natural rubber from its defense stockpile, if new legislation introduced by House Armed Services Committee chairman Carl Vinson is passed. Little or no Congressional opposition against the sale is expected.

General Services Administration—caretaker of the stockpile—last September asked Congress for disposal authority after the Office of Civil and Defense Mobilization ruled that rubber was no longer needed for national defense. In support of his proposal, Vinson says the government would make up to \$30 million on the deal (at current prices) and would also save "enormous" warehousing costs.

General Services Administration gave these price ranges: when the natural rubber market falls below 30e/lb., no sales will be made; when the market is 30-32e, the government will sell 9,000 tons/quarter; when the market is 32-34e, GSA will sell 18,000 tons; from 34-36e, 27,000 tons/quarter; 36e or higher, no limit.

Last year Congress cut off funds to replace deteriorated stocks, thus ending GSA's periodic sales of deteriorated rubber. This move, coupled with word of plans to sell the entire stockpile, ruffled world rubber markets—until it was made clear that disposal would be spread over a nine-year period to avoid disturbing normal markets.

Now operating: Oronite's multimillion-dollar detergent alkylate plant at Richmond, Calif.—under construction the past 18 months. The unit will produce "detergent polymer," which will be processed into Alkane 60 detergent alkylate, a detergent base. Oronite claims Alkane 60 is superior to conventional dodecyl benzene products because of its "increased molecular weight."

Oronite has blueprinted a broad marketing program in the U.S. and abroad to capitalize on a growing export market for alkylates (CW, March 1, '58, p. 49). In fact Oronite was one of the first to tap the export market, which it started exploiting right after World War II. It now sells in more than a score of other countries.

Dow Chemical last week started polyethylene film plants, one at Fresno, Calif., for Western markets; another at Findlay, O., for Midwest and Eastern markets.

Dow will offer film in thicknesses ranging from ½ to 10 mils. A total PE film market of 650 million lbs./year—double '59 demand—is forecast for '65.

Other producers who are expanding PE operations are also betting heavily on growing film markets. Union Carbide Plastics Co., for

#### Market

Newsletter

(Continued)

example, will boost its PE output by 170 million lbs./year when new units at Seadrift and Texas City, Tex., start up in '61.

UCP spokesmen note that some 40% of all domestic polyethylene now goes into film, mainly for packaging. Major growth areas include a 20-fold increase in bread overwrapping and a doubling of produce packaging by '65.

An across-the-board 12¢/lb. reduction of hydroxyl ethyl cellulose prices by Union Carbide brings Cellosize tabs down to 84¢/lb. in truckload quantities (20,000 lbs. or more) and 89¢/lb. for lesser quantities. Reasons: expanded facilities, attempt to broaden markets.

The battle for packaging-film markets will wax even hotter in '60. Notice of this was served this week at American Management Assn.'s 29th National Packaging Exposition at Atlantic City, N.J. Competitive highlights:

- Goodyear Tire and Rubber Co. predicts record sales this year for its Pliofilm, Vitafilm F and Videne TC packaging films. A. F. Thomas, films and flooring sales manager, says that first-quarter film sales were up 15% over '59, 32% over first-quarter '59. Film capacity is up 40%.
- Dow Chemical Co. is shifting to a new national distribution system for its Polyfilm polyethylene film (see above). The system puts film sales to industry groups in the hands of existing Dow sales forces serving those groups. For example, the agricultural chemicals sales force will sell Polyfilm to farm customers, the film sales group will sell to flexible-packaging converters, the building sales group will sell to builders, and Polyfilm sales to end-user industries will be made by Dow's Dobeckmun Co. division.
- Du Pont is making a big push for cellophane sales. Citing a 2% (from 25% to 27%) growth in cellophane's share of the flexible-packaging-material market last year, Du Pont predicts sales of 600 millions lbs. by '70, a 40% jump over '59 sales of 436 million lbs. Now ready to plunge into the polyethylene-cellophane packaging film battle is Du Pont's new cellophane MSD-60, which heat-seals at temperatures 50 degrees below temperatures required to heat-seal other cellophanes. Production of MSD-60 is under way at all five Du Pont cellophane plants.

Commercial production of liquid helium and liquid hydrogen will start this month at Air Products' new ultra low-temperature plant at Iselin, N.J. Integrated design of the plant will permit production of one liquid when no production of the other is required. The liquid gases will be delivered by truck—in specially designed vacuum-insulated containers—to customers within 600-mile radius. Shipments by air freight are also planned.

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In these fields, Pittsburgh Chemical will vigorously maintain a policy of planned growth and expansion through (1) intensive new process and application research, (2) alert, personalized sales service and (3) responsive and competent technical assistance.

We believe this policy will inevitably contribute to the growth and profit of Pittsburgh Chemical Company's customers.



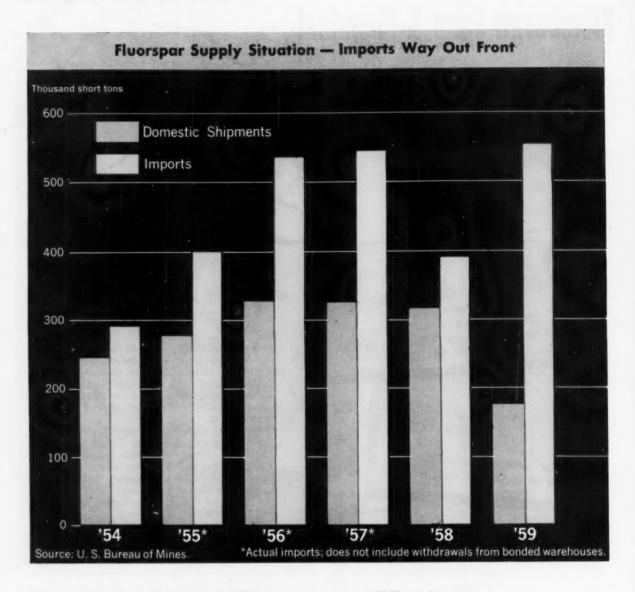
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#### MARKETS



#### Imports Cloud Fluorspar Horizon

Newest '59 Bureau of Mines figures on fluorspar are anything but encouraging for domestic producers. Last year imports hit a new high, accounting for about 75% of total U.S. supplies, while domestic shipments fell off to their lowest level in 20 years.

For the U.S. chemical industry it foreshadows an almost complete dependence on imported fluorspar materials to supply the growing needs of hydrogen fluoride and aluminum producers.

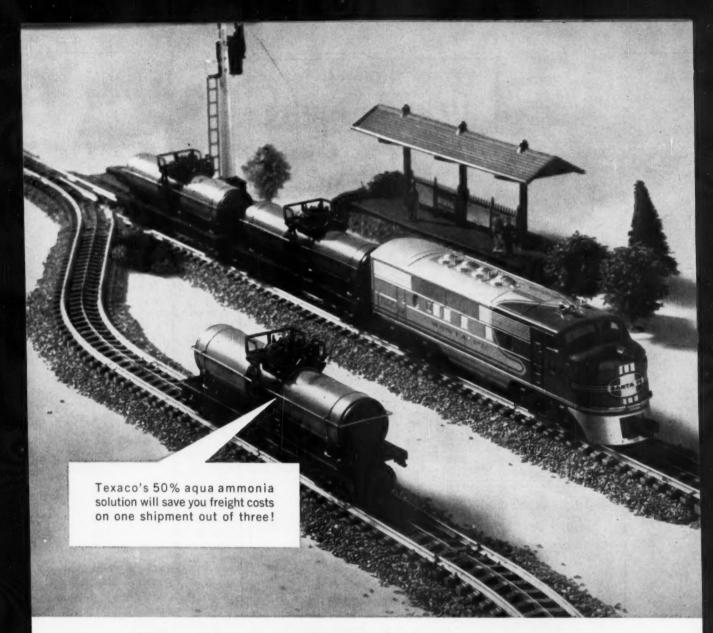
Other industries will be facing the same plight; fluorspar is widely used

by the steel, glass, foundry and enamel industries, among others.

Rising Fast: Fluorspar consumption during the past decade has been steadily rising. In '50, consumption was about 426,000 tons; by '57, it had reached a record high of 645,000 tons, an increase of 51% over '50. The '58 recession dropped consumption to 494,000 tons, but heavy demands in all industries pushed it up to 589,000 tons, an increase of 19% over '58. Most of this growth was by the hydrogen fluoride and aluminum industries (CW, March 26, p. 101).

And, with continued growth in prospect for hydrogen fluoride, steel and aluminum, demands for fluorspar should soon be hitting record levels again. But how much of this anticipated growth will be supplied by domestic production is a moot question.

During the '50s, imported material captured the largest share of the new business, while domestic production was on a plateau. The latter fluctuated in the narrow range of 300-350 tons/year during this period. And last year the U.S. industry suffered its greatest setback, as shipments were almost cut



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On the front of the top plate are mounted the guide.

On the front of the top plate are mounted the guide, backstop, and cutting wheel holder. Six standard cutting wheels are provided in one unit, and are rotated out of the way as they become blunt. They can be replaced easily. On the top-plate are two pillars, between which the replaceable nickel/chrome wire is connected.

The apparatus is supplied for use on 120 volts, with 20 feet of 27 S.W.G. nickel/chrome wire and a set of six cutting wheels.

Cat. No. W-63762 Glass Tube Cutter, Complete \$72.50 Cat. No. W-63763 Replacement Wire, Per 20' Length .60 Cat. No. W-63764 Replacement Cutting Wheels, Set 1.35



#### MARKETS

in half-they totaled a little less than 178,000 tons.

In contrast, imports showed a healthy growth during the same period and, except during the recessions of '54 and '58, in each case exceeded their previous year's record. Fluorspar imports surged from about 164,000 tons in '50 to nearly 556,000 tons in '59-an increase of almost 240%.

Shutting Down: For many independent fluorspar producers, the competition in '59 was too much. The government stopped purchasing material for the stockpile and, except in the Midwest, most producers were unable to compete with imports coming in on all three coasts, East, West and South. As a result, several fluorspar producers were forced to shut down operations.

The fluorspar problem is primarily a question of economics. Many fluorspar deposits are geographically uneconomical, since they require rail travel to reach their markets. Meanwhile, imported material-transported mainly by water-can be laid down at consuming points located near water at lower cost than domestic product.

Most of the domestic mills producing acid-grade fluorspar also recover the lead and zinc sulfides found in fluorspar deposits. Revenue from these sources helped keep some companies in the black. But most independent companies still in the business have drastically curtailed plans for further fluorspar exploration, a situation that can lead only to our increased dependence on foreign sources.

Three Foreign Suppliers: Mexico has supplied the largest share of the imported material. Several American companies (e.g., Alcoa, Reynolds, Dow, Du Pont, Penn Salt, General Chemical, etc.) are reported to be actively looking for new Mexican deposits. Dow's Mexican subsidiary La Domincia, S.A. de C.V., mines and sells fluorspar and has a 100-tons/day milling plant.

But both Italy and Spain continue to increase their share of the market; in '59, each sent record shipments of fluorspar to this country.

Of the imports from Mexico, over half (223,443 tons) was fluorspar material containing less than 97% calcium fluoride.

Fluorspar imports from Italy and Spain were almost all acid-grade ma-



And that's not all. For more than three years, Rheem Centrifugal Spray has been delivering lined drums free of pinholes, blisters, globs or skips. Air turbulence is eliminated. Human error is eliminated. Linings are cured by unique Rheem Vertical Curing in three stage, high temperature ovens. For more information, or help in developing a lining for a problem product, write the world's largest manufacturer of steel shipping containers at 1701 West Edgar Road, Linden, New Jersey. Plants across the country . . . Chicago, Houston, Linden, New Orleans, Richmond, Calif.; South Gate, Calif.; Tacoma. For other sales offices see the Yellow Pages.



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to dissolve faster in resins, monomers
and plasticizers. It saves production time —
boosts production rate with attendant
economies for you.

## LUCIDOL BENZOYL PEROXIDE

Write for Data Sheet or Consult Chemical Materials Catalog Page 199



LUCIDOL DIVISION

WALLACE & TIERNAN INCORPORATED

BUFFALO 5. NEW YORK

#### MARKETS

terial—i.e., containing more than 97% calcium fluoride.

Italy took the lead on acid-grade material, sending over 135,000 tons to this country in '59. This was an increase of 129% over '58 and 75% over '57.

Imports from Spain also took a big jump in '59; shipments totaling more than 70,000 tons were landed in the U.S. This was an increase of more than 47% over the 47,619 tons brought in from Spain during '58.

Mexican imports of acid grade were below 100,000 tons for the first time in several years. However, the less-than-97% grade was imported at a near-record level: 223,443 tons.

Thus, during '59, U.S. chemical consumers were almost totally dependent on three fcreign suppliers, two of which are several thousand miles from U.S. markets. And these two sources, Italy and Spain, supplied the largest share of acid-grade fluorspar necessary for chemical and aluminum manufacture.

Worldwide Fluorspar Problems:
Meanwhile, some new long-range situations may be shaping that could cut into U.S. fluorspar consumers' sources of supply.

Europe and many other parts of the world are feeling the growing demand for consumer goods, many of which will require products derived from fluorspar. For example, world demand for fluorocarbons, for which fluorspar is an important raw material, reportedly is rising rapidly, due to greater demand for aerosol products and air conditioners. At the same time, there are growing world requirements for steel and aluminum, which will also draw heavily on supplies of fluorspar.

And the drain on fluorspar supplies could become more serious if Communist China, a fairly important world producer, should cease exporting large quantities to Russia and Japan, send these two big customers into the world market.

Japan, which produces only a fraction of fluorspar requirements for the country's growing iron and steel industry, has been obtaining more than half of its needs from Communist China. In '57, Japan reportedly imported nearly 40,000 short tons of the mineral from Communist China, probably much more in '59.

Russia obtained more than 100,000

short tons of the material from Communist China in '57.

Thus it seems that some protection must be given to domestic producers, so that the U.S. does not become completely dependent on foreign sources for this important raw material. Encouragement for domestic producers, through a wider sharing of existing markets, would stimulate further exploration and development of new reserves. It would also lead to more research for upgrading some of the lower grades of U.S. fluorspar.

#### MARKETPLACE

Selenium: U.S. production and consumption of selenium showed big gains in '59, according to recently released figures by the Bureau of Mines. Imports also were higher. Selenium output last year was 799,097 lbs., a 10% jump over '58, despite curtailment of production during the last five months of the year due to the copper strike. Shipments registered a gain of 37% over '58, totaling 1,010,705 lbs., slightly less than the record 1,035,000 lbs. scored in '56.

Imports of selenium and selenium salts were up 22% over '58. Final tally for '59; 223,699 lbs. Canada supplied the largest part of the foreign material: 168,294 lbs.

Manufacture of dry-plate rectifiers accounted for approximately half of the selenium used in '59. Other important outlets include pigments, glass, ceramic and metallurgical applications.

Alum: Stauffer Chemical will start up its new alum plant at Vernon, Calif., in about one month. Capacity: 500 to 1,000 tons/month, depending on demand. It's Stauffer's fourth alum plant on the West Coast.

Cobalt Chemicals: A two-page pamphlet titled "Properties and Uses of Commercially Available Cobalt Compounds" is offered by Cobalt Information Center, c/o Battelle Memorial Institute, 505 King Ave., Columbus 1, O. Foreign requests should be sent to Centre d'Information du Cobalt, 35, rue des Colonies, Brussels, Belgium. Included is a listing of 46 organic and inorganic cobalt compounds, with information on their uses, formula, molecular weight, melting point, etc.





#### SPECIALTIES

#### Lestoil Wooed and Won

Adell Chemical Co., Inc. (Holyoke, Mass.), maker of liquid Lestoil, was bought last week by Standard International Corp., an Andover, Mass., holding company. It was the last of a stream of tempting offers Adell had received since its highly successful "all-purpose" detergent stirred up the soap field a few years ago.

Included in the sale were Adell, the parent company; Lestoil, Inc.; Lestoil Ltd. of Canada; Jackson Associates, Lestoil's advertising agency; and JLB Realty Trust. Purchase price was not disclosed.

Reason for Sale: Adell President Jacob L. Barowsky gave two reasons for his decision to sell. The estate tax picture for a family-owned business such as Adell is unfavorable, he feels.

Barowsky insisted upon a purchaser that would maintain Adell's management, policies and product promotion. Standard International, he feels, meets this requirement.

Adell had been deluged with offers during the past few years, with many inquiries coming from competing detergent marketers. Colgate-Palmolive reportedly offered \$25 million for Lestoil several years ago.

Barowsky will continue to play an active role in the management of the company and serve as chairman of the board. Other top officers will remain: Aaron L. Kingsberg, vice-president and controller of Adell and president of Jackson Associates; and I. L. Eskenasy, executive vice-president of Adell

Who Is Standard? The new owners of Adell, while new to the detergents field, are active in a variety of other businesses. Standard International is made up of these divisions, subsidiaries and affiliates: Standard Publishing Co. (Cincinnati), publications; J. N. Rawleigh Co. (High Point, N.C.), finance and factoring; Roehlen Engraving Works, Inc. (Rochester), embossing rolls; Union-Everedy Co., Inc. (Frederick, Md.), chrome plated steel housewares; Boltawerke GmbH. (Nurnberg, Germany) and Bolta-Argentine (Buenos Aires), plastic products.

John Bolten, Sr., chairman of the board of Standard, founded the Bolta

Co. of New England, maker of plastics for furniture and home furnishings. In '54, the company merged with General Tire and Rubber Co., of which Bolten is now a director.

Soap Shakeup: Adell, founded by Barowsky as a one-man operation back in '33, jogged along for over 20 years, selling Lestoil for industrial uses—e.g., to textile mills, commerical laundries, paper mills.

In '54, Lestoil was introduced into retail markets, accompanied by a spectacular spot TV advertising campaign. Sales zoomed from \$500,000 in '54 to \$24 million in '59. Last year, Adell was spending over \$10 million in spot TV on 250 stations and distributing its liquid detergent in 26 states and several foreign countries.

The major soap companies, caught napping while Adell scored in the liquid field, hurriedly tried to bring out competitive products (CW, Nov. 7, '59, p. 83). Lever Bros. began testing its Handy Andy in July '58, while Procter & Gamble introduced Mr. Clean and Colgate-Palmolive its Genie the same year.

Dozens of smaller soapers decided also to get into the act. Competition cropped up from Pine-Sol (Dumas-Milner), So-Kleen (B. T. Babbitt), Liquid Soilax (Economics Laboratory), Liquid Barcolene (Barcolene), Bon Ami All-Purpose Cleaner (Bon Ami), Texize Cleaner (Texize Chemicals), Speedy Fels (Fels), and a flock of others

Regional and local detergent makers pushed their entries into the expanding liquid field. Some of them had already been selling this type of product for years but never had much sales success until Lestoil, Mr. Clean, etc., were accepted.

Private brands, sold mainly in supermarkets, and selling for 30% below national brands, began to grow in importance.

As recently as last fall, Lestoil was still in front, seemingly unruffled by its giant competitors. Recently, however, P&G's Mr. Clean has moved up into the No. 1 sales spot, with Lestoil No. 2, Handy Andy No. 3, and Texize Cleaner No. 4. (Texize Chemicals, in Greenville, S.C., has



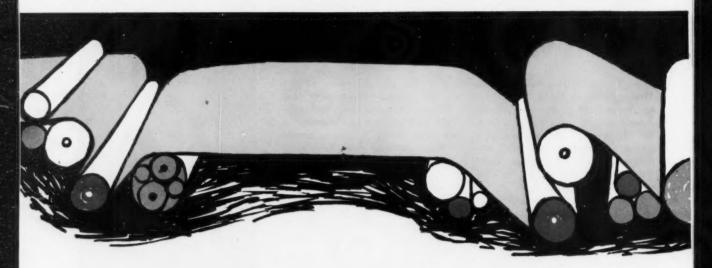
Adell President Jacob Barowsky set standards for hopeful purchasers.

been called a Southern version of Adell. It, too, has had phenomenal success with its detergents in the Southeast and Southwest.)

Last summer Adell entered the dry bleach field with Lestare, a potassium monopersulfate bleach packaged in one-shot, methyl cellulose packets.

**Expansion Ahead:** Barowsky hints of several new household cleaning products planned for the near future. He doesn't elaborate.

Expanded production facilities are also in the offing: either an addition to the existing 150,000-sq. ft. plant or an entirely new plant. Barowsky optimistically sums it up this way: "We are bulging at the seams with our present production, and new products will not only make [expansion] a possibility but a necessity."



#### **Development of Improved Printing Inks**

Fluorescent ink has made a major breakthrough into the lush packaging market. Beginning this week all of Procter & Gamble's Tide cartons will carry a portion printed in single-impression, orange-colored, fluorescent gravure ink. With this boost, packaging may well become a multimillion-dollar/year market for fluorescent inks in the next few years.

The new Tide detergent package (figuring on about 400 million units/year) should itself account for about \$200,000 worth of fluorescent ink. That's based on an average price of \$2.50/lb. of ink and a total ink reguirement of around 80,000 lbs. The new package is the result of a twoyear project involving P&G, Ohio Box Board Co. and inkmakers. Among the inkmakers thought to be supplying the fluorescent inks for the project are Switzer Bros. (Cleveland), Interchemical Corp. (New York) and Sun Chemical Corp. (New York). The decision to market the glowing package nationally was the result of successful test marketing in New Eng-

Bright Side of the News: Another significant breakthrough for fluorescent inks is the recent development by Sinclair & Valentine, division of American-Marietta (New York), of a new fluorescent ink for newspapers, called Glo-News. Ads using this ink were run by Chevrolet in the Detroit News on March 16. (Similar ads were run in a Canadian newspaper

some months before the U.S. papers introduced the new ink.)

In addition, there have been significant recent strides in the development of heat-set inks, which eliminate many of the headaches—piling, lower running speeds, overlapping, etc.—associated with these brilliant inks in the past.

The Dark Side: If these fluorescent materials are successful, it will be a big step forward in what's been a fairly rough climb for makers of these materials.

Outfits in this field have found that to open new markets they must be producers of the fluorescent pigments, makers of the commercial products and ink promotors all rolled into one. To do this, it's necessary to spend 6-8% of gross revenues for outside advertising and promotion; well over 10% for research and development. Fluorescent products have been anything but an overnight success.

As early as '35, for instance, the experimenters were making fluorescent materials made of dyes dissolved in lacquers or spirit varnishes. These, however, deteriorated in a matter of hours in the sunlight.

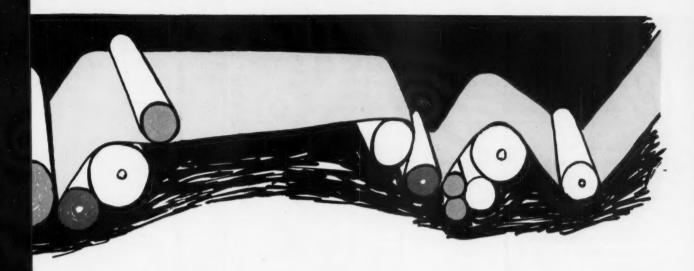
Later, dye solutions were made into pigments many times more stable. When ground into powders, these pigments could be put into normal, flexible paint vehicles. Also in this period, a way was found of putting fluorescent dyes into high-molecular-weight cellulose acetate fibers that

had reasonable flexibility. Textiles of this type were widely used in World War II. Lightfastness was gradually and constantly improved during this period.

The Resin's the Reason: A major improvement, which more than doubled lightfastness, came in '54, with discovery of a class of friable thermoplastic resins that could serve as a powdered matrix for the dyes. These resins maintain the dyes in a state of solid suspension and stabilize them. Fluorescent dyes are melted into the resin and baked. When the resin returns to normal temperature it is glasslike, very brittle. This material is easily powdered, yet is insoluble in normal paint or ink vehicles.

Daylight fluorescent color bodies are complex, synthetic organic dyes that reflect a selective part of the daylight color spectrum and, instead of dissipating the remainder as heat, convert it into the light color ordinarily reflected by that color body. Since this adds the reflected color to the emitted color, a superbright effect is achieved.

The two primary classes of materials from which dyestuffs are made include the rhodamines and the naphthylamides, both coal-tar derivatives. Chemical companies such as American Cyanamid, Du Pont, General Aniline, National Aniline, Geigy, Ciba, and Sandoz supply these materials.



#### **Brightens Future of Fluorescent Pigments**

Besides Switzer Bros., which sells its products under the Day Glo trademark, Lawter Chemicals (Chicago) has a series of products called Hi-Viz; and Radiant Color (Oakland, Calif.), a type tradenamed Velva-Glo.

Recently these companies have made some effort to make more raw materials. Three years ago, for instance, Switzer began manufacture of its own dyes. Switzer claims that its method of making the dyestuffs differs from conventional ways, yields high-purity products at minimum cost. In the last 18 months, it has been making about 75% of its colorant requirements. The company also makes the resins that form the pigment matrix for its products; these are sulfonamide resins made by a fusion method.

Lawter produces some of its dyes, all of its resin matrixes and some of the organic chemicals that go into the resins. Radiant is thought to be buying all of its dyes, producing most of its resins.

Enter Inks: The first pigmented silk screen process printing inks were introduced about '47. Today, Switzer, Lawter, Radiant Color, plus about nine secondary producers, all supply silk screen ink. Total U.S. consumption is estimated at around 100,000 gal./year. A gallon of fluorescent silk screen inks weighs about 8-9 lbs. and silk screeners further thin this ink 20-30%. Total annual coverage is close to 100 million sq.ft. Principal

uses are display cards, outdoor posters, point-of-purchase materials. The largest single identifiable market; service station promotional trim.

Hard to Handle: Although fluorescent inks have had good acceptance in silk screen printing for some time, and more recently in gravure work, progress has not been very encouraging as yet in the commercial offset and letterpress field. There are still some problems-such as filling and piling-which hamper the growth of these inks. Another drawback is the extreme care that must be taken to prevent contamination of the ink, which calls for an immaculate press and special handling. Also, to produce the desired fluorescent effect, it's often necessary to overprint-driving costs up and some prospective users out. The inks themselves are fairly expensive; they're double the cost of regular-grade color ink, quadruple the cost of newspaper R.O.P. colors.

Paint Use Growing: A growing market for the fluorescent pigments is the paint field. In this application, fluorescent pigments are generally used at a ratio of 1.5 parts pigment to 1 part of vehicle solids (by weight). Extender pigments (such as silica gel, talc, calcium carbonate, etc.) are used to produce light diffusing and surface matting properties.

One big market for the fluorescent paints is for aircraft marking. The usage here has been estimated at over 100,000 gal. annually. This includes gallonage for the clear, ultraviolet-absorbing overcoat, which is used at about a 2:3 ratio with the paint. The ultraviolet absorber increases lightfastness of fluorescent inks 10-15%, also gives a glossier finish.

Lawter claims that it is working on pigments now that will eliminate the need for this protective coating.

Although there are some 14 separate paint systems on the Qualified Products List, it's thought that well over 90% of the military requirements in this field are supplied by Lawter, Switzer and Radiant Color.

Industrial and marine safety paints are catching hold rapidly too. This market is expected to double its consumption each year over the next several years. Besides the three combined pigment and paint manufacturers, there are about a dozen secondary paintmakers offering fluorescent safety paints.

Aerosol paints, introduced around '53, though plagued at first with problems such as pigment settling, valve problems and high cost, now are beginning to show a steady growth. A typical fluorescent aerosol paint formulation has around 5-10% plasticized acrylic resin, 15-20% pigment (with an average particle size of about 3.5 microns), plus aromatic solvents and a small amount of suspending agent.

Acrylic resins are used because

they're water-white and transparent enough to transmit light of the wave length required for optimum fluorescence. Also, acrylic films have good resistance to yellowing and degradation from ultraviolet and can be dissolved in aromatic solvents without the need for ketones and esters. About half the content weight is generally propellant.

Glowing Plastic Prospects: In the plastics field, there are a growing number of molders, extruders and coaters of plastisols interested in using high-visibility materials in items such as toys, sporting goods, kitchen ware, garden implements, sportswear (helmets, hunting jackets, etc.) and plastic fabrics for flags and pennants. Consumption of the fluorescent pigments in this market is expected to double annually over the next few years.

Others: Two other areas that are becoming more important to the fluorescent pigment makers are the paper and textile fields. Papers coated with the fluorescent pigments are finding more jobs — e.g., for such items as price tags. Switzer is working with Crocker Burbank (Fitchburg, Mass.) on this product; Lawter is working with Marvellum Co. (Holyoke, Mass.) and Radiant — perhaps the biggest in this particular product area — coats its own paper.

In the textile field, the fluorescent pigments are being used as tint brighteners in shades from red through yellow. (It's not yet possible to make a bright fluorescent color in the short wave-length end of the spectrum—blues, for instance, have poor light-fastness, are extremely unstable.)

One thing that should help create new markets for the fluorescent colors is their steadily decreasing cost.

Their price is just about one-half of what it was around 10 years ago (an exception: printing ink fluorescents, which still cost \$2-3/lb.). Aircraft fluorescents are about \$1-2/lb., heat-and solvent-resistant materials overlap between \$1-3/lb., and paint sprays, the least expensive, range between \$1-2.

More important, technical improvements—such as better lightfastness should spur more people into looking at the fluorescent pigments. Color TV is making consumers—and merchandisers—continually more aware of color. Use of fluorescent inks by P&G is the move that may set a pattern, create bright new markets for makers of these materials.

Legalistic Aspect: Anyone desiring to get into the fluorescent pigment business will have to come into it well-staffed with legal aides. There have been charges of antitrust violations, and patent infringements in this industry for years. And some suits are still pending.

For the companies in the field, however, the prospects of burgeoning markets brought about by the new packaging and newspaper inks override the familiar legal problems. The big sales long predicted for the fluorescent inks now seem within grasp.

The fighting now going on in the courts has been characterized by Daniel Terra, president of Lawter Chemicals, as squabbling over trifles. He thinks the issues are not germane to the future growth of the industry, that they are scaring off prospective customers, are generally doing more harm than good.

Good Year Ahead: In '60, the fluorescent pigment makers will likely gross around \$4.5 million. This, CHEMICAL WEEK estimates, will be divided as follows: around \$1 million each for military and industrial safety uses; around \$750,000 for plastics; about \$500,000 for screen process printing; \$250,000 for paper coatings; and \$1 million for miscellaneous uses (including fluorescent inks).

#### Go-Ahead for Tedion

Government approval was given last week for extended use of Tedion, a Dutch-developed miticide offered in the U.S. by Niagara Chemical Division of Food Machinery and Chemical Corp. (Middleport, N.Y.). It has been okayed for use on 11 deciduous fruits, including apples, peaches and cherries. (Earlier this year Tedion was approved for use on citrus fruits.) Chemically the miticide is 2,4,4'5-tetrachlorodiphenylsulfone.

The Food & Drug Administration set a tolerance of 5 ppm. for the 11 fruits, making possible three applications of miticide during the growing season. Previously, applications could be made only during the early part of the season; now treatments for summer mites are possible when fruit is on the trees.

#### PRODUCTS

Combustion Chemical: Nalco Chemical Co. (6216 West 66th Place, Chicago) now offers its Nalco 159, a clear, oil-soluble liquid to protect residual oil-fired boilers against slag and corrosion. Reported advantages: less draft loss and increased boiler efficiency. The product, packaged in 54-gal., nonreturnable drums, can be added to the oil storage tank or pumped into oil transfer lines.

Packaging Switch: Duon, Inc. (Coral Gables, Fla.), is now marketing its professional shampoo, Vita Fluff, in a polyethylene squeeze tube. The new container, by Bradley-Sun Division of American Can Co. (Hillside, N.J.), reportedly affords lower shipping costs, is spillproof and unbreakable, and is easier for one-handed application by beauty operators.

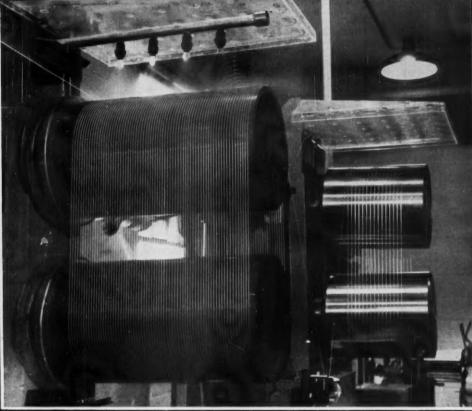
Aerosol Equipment: Aerosol Machinery Co. (Westbury, L.I., N.Y.) has added a new line, the AMCO Pressure Burette, for injecting propellant into aerosol cans. The portable, hand-operated machine is designed for small production runs and lab work. It's available for use with nitrogen at small extra cost.

Paint Additive: Dewey and Almy Chemical Division of W. R. Grace Co. (Cambridge 40, Mass.) is now selling Daxad 40, a new dispersing agent. It's said to make possible the manufacture of gloss emulsion paints with a dissolver rather than pebble or roller mill. The product is reported to function as a pigment dispersant, stabilizing agent, and protective colloid.

Molding Compound: Thermomat, a molding compound for producing components that must withstand high heat and pressure, is offered by Johns-Manville (New York). The non-woven asbestos felt, saturated with a thermosetting phenolic resin and an inorganic filler, is said to be particularly applicable in aviation, missile and rocket applications. It's available in sheet form.

Equipment Cleaner: Allied Chemical's Petrochemical Division (New York) is marketing a new cleaning compound for removing thermoplas-

Experimental tire cord yarn being spun at Buckeye Technical Laboratories in Memphis



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| Agency—Barber & Drullard, Inc.  | TEXACO, INC   | Penobecot Bldg., WOodward 2-1793  Frankfurt/Mala. Stanley Kimes   |
| HARDINGE COMPANY, INC 78 Agency—Adams Associates, Inc.  | UNION BAG-CAMP PAPER CORP II<br>Agency-Smith, Hagel & Knudsen, Inc.                                       | Frankfurt/Moin  |
| HARSHAW CHEMICAL CO   | UNION CARBIDE CHEMICALS CO., DIV.<br>OF UNION CARBIDE CORP  | 2 Place du Port, Geneva, Switz. London E.C. 4. E. E. Schirmer, McGraw-Hill House, 95 Farringdon St., England      |
| HERCULES POWDER CO  | Agency—J. M. Mathes, Inc.  UNION STEEL CORP   | Hill House, 95 Farringdon St., England<br>Los Angeles 17 Robert Yocom, 1125<br>West Sixth St., HUntley 2-5450     |
| *HOOKER CHEMICAL CORP 8 Agency—The Rumrill Co., Inc.  | *U. S. INDUSTRIAL CHEMICALS CO., DIV. NATIONAL DISTILLERS & CHEMICAL CORP. 10 Agency—G. M. Basford Co.    | New York 36 Knox Armstreng,<br>B. A. Johnson, P. E. McPherson, Charles<br>F. Onasch, L. Charles Todaro, 500 5th   |
| *JEFFERSON CHEMICAL CO 41 Agency-Robinson-Gerard-McGary, Inc.   |   | Ave., Oxford 5-5959   |
| LUCIDOL DIV. OF WALLACE & TIERNAN, INC  | U. S. RUBBER CO., WAUGATUCK<br>CHEMICAL DIV. 38-39<br>Agency—Fletcher Richards, Calkins &<br>Holden, Inc. | Philodelphic 3. William B. Hannum, Jr.,<br>6 Penn Center Plaza, LOcust 8-4330<br>Pittshurah 22 Duncan C. Stephens |
|   |   | Pittsburgh 22 Duncan C. Stephens,<br>Room 1111 Henry W. Oliver Bldg.,   |
| MICHIGAN CHEMICAL CORP 60<br>Agency—Aves, Shaw & Ring, Inc.   | Agency—Farson, Huff & Northlich, Adv.   | San Francisce 4 William C. Woolston.<br>68 Post St., DOuglas 2-4600   |
| MINNEAPOLIS-HONEYWELL REGULATOR CO  | WESTERN CONDENSING CO   | St. Louis 8R. J. Claussen, 3615<br>Olive St., Continental Bldg., JEfferson<br>5-4867                              |

\*For complete product data see catalog unit in the BUYERS' GUIDE ISSUE for 1959-60

tic material from extrusion and injection machines. It's called A-C Cleaning Compound, is said to cut time required for cleaning operations and to have good heat stability over a wide range of temperatures.

Antistatic Agent: Onyx Oil & Chemical Co. (Jersey City 2, N.J.) is marketing Aston 123, an antistatic agent said to require no complicated processing and to be applicable in standard finishing-plant equipment. It is applied by cross-linking with Eponite 100 made by Shell Chemical Co. (New York).

Carbon Inks: Micropoint, Inc. (Sunnyvale, Calif.), is selling a new line of carbon-based colored inks named Copy-Fax. Said to be the first colored inks to contain carbon, they are reported to be compatible with all major copy machines. Red, green and blue are now available; other colors are said to be in development.

Stretch Added: Stretch Fabrics, Inc. (New York), is making stretchable terry cloth, combining cotton and Chemstrand Corp.'s (New York) textured nylon. Called Terry Stretch cloth, it has a cotton facing with nylon backing. The cloth will first appear in infant's clothing-it "grows" with the child. A variety of colors are offered.

Staph-Fighting Polyethylene: Dow Chemical Co. (Midland, Mich.) has developed a bacteria-fighting polyethylene called Surfaseptic. Major uses: in toys, waste baskets, telephone headsets, arm rests of public transportation. The custom-designed formulations will be supplied in granular or pellet form in 50-lb. bags or in bulk.

Spray Mulch: Alco Oil & Chemical Corp. (Trenton Ave. and William St., Philadelphia) has introduced an agricultural spray for mulching roadsides and landscapes. Vulcanol, described as a nonflammable, nonirritating elastomeric polymer emulsion, can be applied with standard spray equipment. Reported to be a surface, rather than a penetrating, treatment, Alco says Vulcanol will stay in place long enough for seed to germinate, lasts three times as long as conventional mulches.

#### Tracers

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#### POSITIONS VACANT

Production—Research, Challenging opportunity for a chemical engineer to head newly created production and research division in well established and expanding company with young, aggressive management. We are seeking a man with ability and ambition to advance and join top executives. Must have experience in Aerosols, Detergents, and Chemical Specialities, with heavy administrative background in Production, Cost, Packaging, and New Product evaluation. The company is located in New York City. Minimum travel is required. All replies will be kept strictly confidential. Please send complete detailed resume including salary requirements, in first letter, to P.3980, Chemical Week.

Chemist—experienced in formulation and quality control of Insecticides, Fungicides and Herbicides. Well established manufacturer located and operating in the Middle Atlantic area has need for two chemists in its current expansion program. Send letter stating training, experience and salary expected to P-4143, Chemical Week.

#### SELLING OPPORTUNITIES AVAILABLE

Specialty equipment company requires monu-facturers representative. Should be in the 35 to 45 age range and presently handling similar accounts. Several territories open. Submit resume to RW-4099, Chemical Week.

Representation for Soxed Carboys—glass & plastic bottles; 5-6½-13-gallon capacity; to cover chemical m'f'ers. Areas open east of Mississippi. May carry other lines. United Box & Lumber Co., 45 Wheeler Point Rd., Newark, N.J.

#### SELLING OPPORTUNITY WANTED

Manufacturer's agent seeks additional capital or consumer goods account for processing industries. Coverage: New England, N. J., N. Y. RA-4057, Chemical Week.

#### POSITION WANTED

Market Development/Sales/Tech'l, Service. M.S. Chem., Age 43. Seeks challenging job where broad experience will make me useful quickly. Plastics, rubber, chemical specialties. Cost control, liaison. PW-4172, Chemical Week.

#### PROFESSIONAL SERVICES

Clark Microanalytical Laboratory—CH. N. S. Halogen, Flourine, Oxygen, Alkoxyl, Alkimide, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

#### CONTRACT WORK WANTED

Custom Grinding-Ultra Fine or Course-Specialty or Volume Blending and Grinding service on unit or contract basis. Complete CO<sup>2</sup> installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Copp., 10881 S. Central Avenue, Box 682 Oak Lawn, Illinois.

Spray Drying—Reputable chemical manufacturer has modern spray dryer located in the Southeast available for custom drying, on volume basis, a wide variety of water soluble materials. Will consider drying solutions or alurries furnished by customer on toll basis. Also equipped to manufacture materials suitable for spray drying. If interested reply CWW-4094, Chemical Week.

Custom Blending—Powders or Liquids. Your formulas or ours. Large or small runs. Quality Controls. CWW-4007, Chemical Week.

#### RUSINESS OPPORTUNITY

Chicago Bulk Chemical or Petroleum Storage site—River front location—Railroad spurs-Access to tollways—Will build to suit—Send for book-let—Hannah Terminals, Box 89, Lemont, Illinois, Chicago, BIshop 2-3210.

#### CHEMICALS FOR SALE

Save Money. Prime Isobutanol Available in tunk cars or tank trucks. "World's Smallest Producer." Mercury Chemical Corp., Edison, N.J. Liberty 8-1540.

#### FOR SALE

Send for Revised Illustrated Circular (a our \$3,000,000 chemical plant liquidation at Orange, Texas. All T316 SS equipment including tanks, columns, heat exchangers, filters, centrifugals, pumps, valves, pipe, etc. Perry Equipment Corp., 1415 N. Sixth Street, Philadelphia 22, Pa.

1960 sq. ft. 7316 Stainless Heat Exchanger, ASME, 1953, Perry Equipment Corporation, 1415 North Sixth Street, Philadelphia 22, Pa.

17,650 gal. 7316 Stainless Horiz. Tank, 9' x 36', ¼" shell, ¾" dished heads, 26 sq. ft. int. coil. Perry, 1415 N. 6th St., Phila., Pa.

Polyethylene Powder (super-fine) regularly available at 25¢/pound; Chemical Week.

Dark Dioctyl Sebacate, Bulk, 32¢ lb. DBS Plast. Virgin Bulk 35¢. Barium Hydrox. N. F. (J. T. Baker Orig.) 15 Leverpaks \$0.06/lb. Toluol 10,000 gals, \$2.0/gal. Isoprene-Enjay virgin 3 drums \$1.5. Ohio Apex KP23 Plasticizer. Orig. drums \$.12/lb. Virgin Neopentyl Glycol-20-1002 drums. Trimethylol Propane 20-1002 drums. Trimethylol Propane 20-1002 drums \$.35/lb. Acctone 10,000 gals. \$45/gal. DDA Plast., Virgin, 20 drs 37¢/lb. FS-4167, Chem. Wk.

#### WANTED

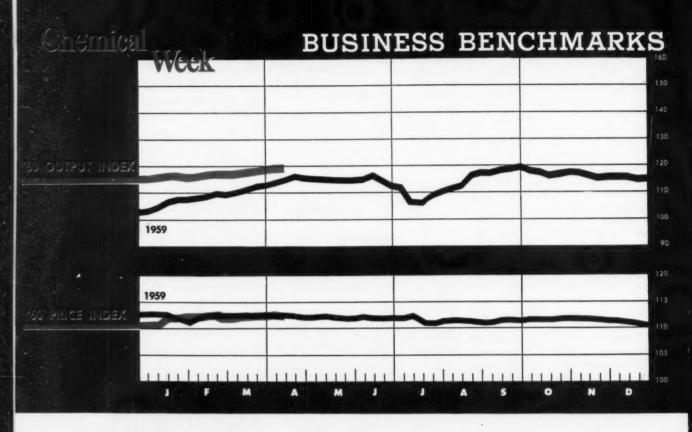
Spectrophotometer, used, complete spectrum, recording type. A. Gersen, P. O. Box 658, Passaic, N. J.

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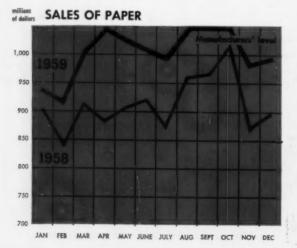
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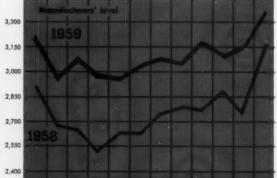


APRIL 9, 1960

| WEEKLY BUSINESS INDICATORS                           | Latest Week  | Preceding Week  | Year Ago |
|--|--------------|-----------------|----------|
| Chemical Week output index (1957=100)                | 118.4        | 118.1           | 114.7    |
| Chemical Week wholesale price index (1947=100)       | 110.7        | 111.4           | 112.0    |
| Stock price index (12 firms, Standard & Poor's)      | 53.07        | 53.37           | 52.25    |
| Steel ingot output (thousand tons)                   | 2,527        | 2,597           | 2,638    |
| Electric power (million kilowatt-hours)              | 13,951       | 14,109          | 12,709   |
| Crude oil and condensate (daily av., thousand bbls.) | 7,078        | 7,116           | 7,194    |
| WHOLESALE PRICE INDICATORS (1947-49=100)             | Latest Month | Preceding Month | Year Ago |
| All commodities (other than farm and foods)          | 128.8        | 128.8           | 127.8    |
| Chemicals and allied products                        | 110.0        | 109.9           | 109.9    |
| Industrial chemicals                                 | 124.2        | 124.1           | 123.7    |
| Paint and paint materials                            | 119.1        | 119.1           | 118.6    |
| Drugs, pharmaceuticals and cosmetics                 | 94.0         | 93.8            | 93.0     |
| Fats and oils (inedible)                             | 49.4         | 49.2            | 58.9     |
| Fertilizer and fertilizer materials                  | 108.8        | 108.8           | 107.5    |
|  |              |                 |          |

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SALES OF PETROLEUM, COAL PRODUCTS

#### GULF... AND THE REMARKABLE PROGRESS OF PETROCHEMICALS

**IN MEDICINE...** Where does chemistry stop and medicine begin? At some point in the transition of benzene to sulfa? When a sheet of polyethylene forms an oxygen tent? When phenol changes into aspirin? When blood starts flowing through a plastic tube?

Petrochemicals have already given much to medicine. And the prospect of future contributions is inspiring. The petrochemical industry is young and modern in concept. But in spite of its youth, it is strong, vigorous, and bursting with pro-

duct potential.

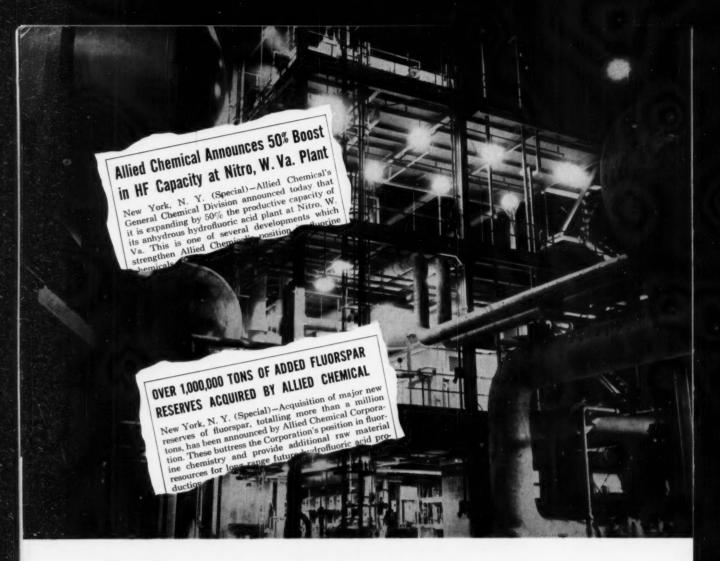
Gulf supplies part of the momentum behind the driving potential of the petrochemical industry. For Gulf supplies the basic raw materials to begin with. Benzene, ethylene, isooctyl alcohol, propylene. Propylene trimer and tetramer, sulfur and toluene. All are produced to highest quality standards and are available for delivery on a prompt and dependable basis. Gulf stands ready to assist you with your contributions to medicine . . . to mankind. Write or phone: Petrochemicals Department Sales Office, Gulf Oil Corporation, 360 Lexington Ave., New York 17.



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## 2 More Big Reasons for Making General Chemical Your HQ for HF

General Chemical recently announced two developments of interest to every consumer of hydrofluoric acid—a 50% increase in anhydrous HF capacity at Nitro, W. Va., and the acquisition of more than 1,000,000 tons of additional fluorspar reserves. Both announcements underscore General's position as the nation's leading supplier of aqueous and anhydrous hydrofluoric acid.

Here are more good reasons why it pays to make General your HQ for HF:

Eight HF supply locations, three producing plants! General Chemical main-

tains eight HF supply points. Of these, three plants located in North Claymont, Delaware; Baton Rouge, Louisiana; and Nitro, West Virginia, make General Chemical the *only* supplier offering shipment of anhydrous as well as aqueous from more than one producing location.

In addition, General Chemical maintains five aqueous HF bulk storage and packaging stations at Buffalo, N. Y.; Chicago, Ill.; Cleveland, Ohio; El Segundo (Los Angeles), Calif.; and Pittsburgh, Pa. These five points back

each other up and further assure service and availability of HF at all times, under all conditions.

Basic position! General Chemical owns and operates its own fluorspar mines and mills... and is the country's leading producer of sulfuric acid. This basic position in the essential raw materials for hydrofluoric acid production is your best assurance of dependable supply.

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